Comprehensive Nutrient Management Plan

Springbrook Farm

Prepared by Dennis J. Godar
In Cooperation With the
Loudon County Soil and Water Conservation District
Date Prepared: 6/7/2012
For Years; 2012-2016

Operation Name: **Springbrook Dairy Farm**
Owner / Operator's Name: **Jason Smith**
Farm Address: **4859 New Hope Road**
Sweetwater, TN 37874

Operation Telephone Number: **(865) 382-0375**

Conservation Planner

As a Conservation Planner, I certify that I have reviewed both the *Comprehensive Nutrient Management Plan* and *Producer Nutrient Management Activities* documents for technical adequacy and that the elements of the documents are technically compatible, reasonable and can be implemented.

Signature: _____ Date: _____
Name: Dennis J Godar
Title: Certification Credentials: TSP #03-2055

Conservation District

The Conservation District has reviewed the CNMP documents and concurs that the plan meets the District's goals.

Signature: _____ Date: _____
Name:
Title:

Owner/Operator

As the owner/operator of this CNMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of the CNMP are needed. I understand that I am responsible for keeping all the necessary records associated with the implementation of this CNMP. It is my intention to implement/accomplish this CNMP in a timely manner as described in the plan.

Signature: _____ Date: _____
Name:

Section 2. Manure and Wastewater Handling and Storage

Signature: _____ Date: _____
Name: Dennis J Godar
Title: Certification Credentials: TSP #03-2055

Sections 4. Land Treatment

Signature: _____ Date: _____
Name: Dennis J Godar
Title: Certification Credentials: TSP #03-2055

Section 6. Nutrient Management

The Nutrient Management component of this plan meets the Tennessee Nutrient Management 590 and Waste Utilization 633 Conservation Practice Standards.

Signature: _____ Date: _____
Name: Dennis J Godar
Title: Certification Credentials: TSP #03-2055

Section 7. Feed Management (if applicable)

Signature: _____ Date: _____
Name:
Title: Certification Credentials:

Section 8. Other Utilization Options (if applicable)

Signature: _____ Date: _____
Name:
Title: Certification Credentials:

Table of Contents

Section 1. Background and Site Information

Purpose of the Comprehensive Nutrient Management Plan (CNMP)

The Comprehensive Nutrient Management Plan (CNMP) is a conservation system for your animal feeding operation. It is designed to address, at a minimum, the soil erosion and water quality concerns on your operation. The following soil erosion and water quality concerns have been identified on your farm:

Manure and Nutrient Management is managing the source, rate, form, timing, placement and utilization of manure, other organic by-products, bio-solids, and other nutrients in the soil and residues. The goal is to effectively and efficiently use the nutrient resources to adequately supply soils and plants to produce food, forage, fiber, and cover while minimizing the transport of nutrients to ground and surface water and environmental degradation.

Nitrogen and Phosphorus vs. Water Quality

Nitrogen and Phosphorus are two nutrients that have the potential to impair the quality of our groundwater and surface water. Nitrogen leaching out the root zone may enter a tile and be transported to surface water or it may leach to the groundwater. The EPA Drinking Water Maximum Contaminant Level (MCL) for Nitrates is 10 mg/L. Phosphorus leachate, or runoff entering the surface water may contribute to excessive algae growth which may cause low oxygen levels in surface water. This in turn may impair aquatic life. This manure and nutrient management plan will help to protect the groundwater and surface water.

1.1. General Description of Operation

Springbrook Dairy is a dairy operation with approximately 250 milking cows and approximately 40 dry cows, 40 calves and 80 growing heifers. The dairy is owned and operated by the Smith Family. Approximately 277 acres of spreadable crop land and pastures are available in this Nutrient Management Plan.

The farm fields are located in a rural area with rolling land in the foothills of the Gaylon Stockton Ridge. The east fields are drained by branch streams flowing east approximately ¼ miles to Pond Creek and the west fields drain overland approximately ½ mile to the Cherry Branch that flows to Pond Creek. Land use in the area is mostly cropland, pastures, hay fields, and woodlands. Grass buffer strips around ponds or along streams and drainage ways that are properly maintained help reduce impacts of soil erosion and nutrient runoff from fields. Grass buffer strips and ponds also provide good wildlife habitat. Forested areas are located within ½ mile northwest and southwest of the dairy.

There is only 1 non-farm residence located within ¼ mile of the facilities, located 1100 feet to the east along New Hope Road. General topography of the crop land in this NMP is 2-12 % slopes.

The operation is located in the Pond Creek sub-watershed, (12-digit HUC: 060102010303) and the Tennessee River-10-digit watershed, (10-digit HUC: 0601020103).
This area is part of the 8-digit HUC: 06010201 Sub-basin known as the Watts Bar Lake Watershed.

(See watershed reports at the end of this section).

1.2. Sampling, Calibration and Other Statements

- Manure sampling frequency: All solid and liquid manure from the storage pond will be sampled and analyzed annually. Use best management procedures for sampling found in manure testing references in Section 6.

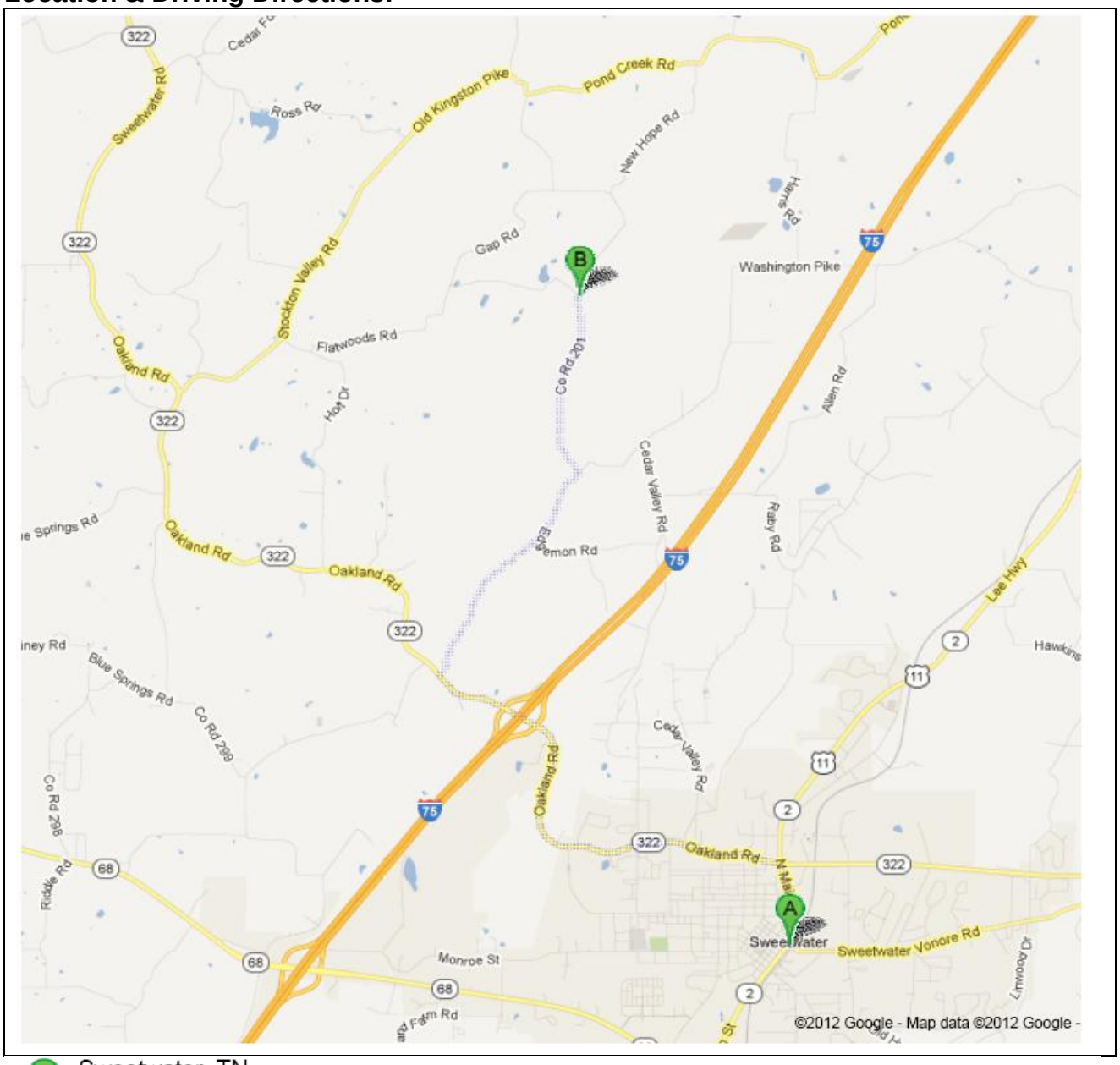
- Soil testing frequency: Soil testing should be done a minimum of every four years. or sooner. Soil testing is an important tool to manage soil fertility with proper use of manure and fertilizers according to crop needs. Use best management procedures for sampling found in soil testing references in Section 6.

- Equipment calibration should be accomplished annually and whenever changing rates. For surface applied solids, use of the 'tarp' method also is a check on uniformity of applications. For drag hose operations a flow-meter is recommended to monitor gallons applied. A staff gage in the storage pond also helps to estimate gallons applied. **For irrigation or surface application of liquid manure, buckets placed in the field can help measure uniformity and also catch samples 'as applied.'**

- Measures to prevent direct contact of animals with water: Dairy cows, when housed inside of barns will have no contact with water resources. Grazing animals should be restricted from having free access to streams. Improved stream crossings should be maintained and exclusion fences are recommended in sensitive areas.

- Silage leachate from the bunk silo is managed by draining from the concrete floors to a collection pit that is drained as needed to the storage pond.

Location & Driving Directions:



A Sweetwater, TN

	1. Head **northeast** on **N Main St** toward **Biggs St**	go 0.5 mi total 0.5 mi
322	2. Take the 3rd left onto **TN-322 W/Oakland Rd** About 5 mins	go 2.9 mi total 3.4 mi
322	3. Keep right at the fork	go 0.2 mi total 3.6 mi
	4. Turn right onto **Pond Creek Rd** About 4 mins	go 1.6 mi total 5.3 mi
	5. Turn left onto **New Hope Rd** About 3 mins	go 1.2 mi total 6.5 mi

B New Hope Rd

1.3. Resource Concerns

Soil Quality Concerns

	Soil Quality Concern	*Fields*
X	Ephemeral Gully Erosion	The irrigated field is using minimum tillage or no-till for corn silage, soybeans and small grain silage production. Ephemeral Erosion appeared minimal. Gully erosion is controlled by grass waterways where needed. Other fields are on a corn soybean rotation and have adequate crop residues to minimize erosion . Cover crops are recommended in steeper areas if needed.
X	Sheet and Rill Erosion	The irrigated field is using minimum tillage or no-till for corn silage, soybeans and small grain silage production. Ephemeral Erosion appeared minimal. Gully erosion is controlled by grass waterways where needed. Other fields are on a corn soybean rotation and have adequate crop residues to minimize erosion . Cover crops are recommended in steeper areas if needed.
X	Stream/Ditchbank Erosion Ponds & spillways	Several streams run through the farm, bordering fields 2, 3 & 4. It is recommended to maintain grass buffers and fencing around the ponds and beside streams to exclude cattle.
	Wind Erosion	Not a problem here.

Soil Erosion/Soil Quality:

This farm practices conservation practices to minimize erosion and improve soil quality. These practices include: Rotational grazing, Fencing, Travel Lanes, Stream Crossing, Buffers and Setbacks. Stock watering systems and this nutrient management plan will also help improve productivity of the grazing system. More information on conservation practices, and "RUSLE 2" individual field profiles (soil loss estimate reports); can be found in Part 4, "Land Treatment Practices". Gully formation is a concern in a few cattle traffic lanes in steeper areas.

Water Quality Concerns

	Water Quality Concern	*Fields*
X	Facility Wastewater Runoff	All wastewater and facility runoff is drained to the storage pond.
X	Manure Runoff (Field Application)	All fields: manure runoff is avoided by not applying at excessive rates, and maintaining a minimum of 40' vegetated buffer along streams.
X	Manure Runoff (From Facilities)	Lot runoff is curbed and drains to the storage pond. Manure is scraped daily from the feed barn and freestalls to a push-off ramp to the storage pond.
X	Nutrients in Groundwater	All fields: nutrient leaching is minimized by not over applying nutrients and using appropriate rates, timing and application methods for manure and fertilizer applications. Soil types have medium to low leaching risks.
X	Nutrients in Surface Water	All fields: in addition to rates and timing considerations listed above, grass waterways and buffer strips along the surface streams and pond are established.
X	Silage Leachate	Silage leachate from several bunk silos is collected in a pit and drained to the storage pond as needed Feed commodities are stored in sheds.

	Water Quality Concern	Fields
X	Excessive Soil Test Phosphorus	Several fields have high soil P levels but only Field 3 is greater than 300 lbs/acre according to 2012 soil tests. No manure applications are planned currently for several fields high in soil P. P levels are projected to decline slightly over time. The Phosphorus Index is rated Low to Medium for all fields. Nutrient plan allows manure applications at nitrogen based rates for all fields.
	Tile-Drained Fields	None

Water Quality:

This farm practices conservation practices to improve water quality for the farm as well as the surrounding watersheds. Surface water is protected from erosion and surface runoff of nutrients by manure application setbacks, filter strips, nutrient management and rotational grazing to reduce erosion and maximize grass & legume growth. Water has been piped to several waterers in the pastures. It is recommended to fence the sensitive areas along the streams. These areas can be flash grazed intermittently to keep vegetation grazed down. This practice would also be beneficial for wildlife.

Other Concerns Addressed

	Other Concern	Fields
X	Acres Available for Manure Application	More than Adequate acres are available for liquid from the dairy storage pond.
X	Aesthetics	Farm is well maintained for older buildings that are still functional. The dairy is in a good location with tree windbreaks that act as visual screens between the road and the dairy.
X	Maximize Nutrient Utilization	Liquid Manure is applied to cropland through a new center pivot irrigation system. This is an efficient way to utilize nutrients and maintain soil fertility evenly over the irrigated field
X	Minimize Nutrient Costs	Commercial fertilizers are minimized on fields where manure is utilized. Manure is the basis of the sustainability of the farm.
X	Neighbor Relations	No problems, good management of facilities should help keep good neighbor relations.
X	Profitability	Home grown forages and good use of manure nutrients to make the operation more sustainable. Cows' longevity, herd health and productivity all contribute to good profitability.
X	Regulations	CNMP meets TN CAFO regulations that apply to CAFO operations.
X	Soil Compaction	Manure applications are planned to be applied through a center pivot irrigation system as needed through the growing season. This eliminates compaction issues due to heavy tank wagons or spreaders on wet ground.

	Other Concern	*Fields*
X	Time Available for Manure Application	Irrigation over growing crops or in between crops allows more flexibility for timing of liquid manure applications.
X	Odors	Daily scraping of manure helps to minimize odors in the barn. Diluting liquid manure applications with fresh water can reduce odors also. Incorporating when feasibly is also a good way to minimize odors from application events.
X	Air Quality	Keeping manure cleaned out of the freestall barns, feed barn, and parlor minimizes odors in the barns. Stir fans and ridge vents also help to improve air quality inside the pack barn.
X	Biosecurity	Farm has a bio-security plan and is a good location for the operation. Restricted entry signs should be posted to help control unnecessary traffic in and out of the farm driveway. Workers should not visit other farms on same day and wear clean clothes and boots to the farm.

Other Concerns:

Air quality is another important resource to maintain. Feed management, manure storage and handling methods are planned that will help to minimize dust and odors generated by this operation. Forage quality management for this operation is also an important concern to keep the cattle doing well grazing on pastures and for silage.

Clean Water Diversions

Clean water is being diverted away from possible contamination with manure or feed. All contaminated water will be collected and placed into one of the waste storage ponds, hauled directly to the field or diverted into filter strips that have been installed to absorb excess nutrients.

Animal Contact with surface water

Fences have been constructed to minimize any contact by the livestock with surface water. Where ponds may be utilized as a source of water for livestock, access will be limited.

Manure Transfer - Spillage

All areas of manure transfer shall be maintained to immediately clean up any spillage. If necessary and practicable, treatment options such as concrete pads, curbs, and bump walls shall be installed adjacent to manure storage and load-out areas to facilitate proper cleanup.

Manure Transfer – Road

Manure transport units will be maintained in good condition. Manure will not be allowed to spill on roadways, or other unauthorized areas. Sealed truck bodies, canvas covers, wetting down dry material and not overloading spreaders are some of the methods that can be used to prevent spilling. Additionally, cleaning of the transport and application units will be done in a manner that does not allow nutrient loading that would be detrimental to soil, air, plant, water or animal recourses.

Waste Storage Closure Plan

If livestock productions ceases at this location, the facilities shall be cleaned up to insure all remaining nutrient sources are removed. Closure will meet or exceed all USDA-NRCS practice standards applicable to closing a waste storage facility, including "Closure of Waste Impoundments (360). All manure and nutrients and waste water shall be removed and applied to available cropland following agronomic rates following USDA-NRCS nutrient management and waste utilization standards and specifications.

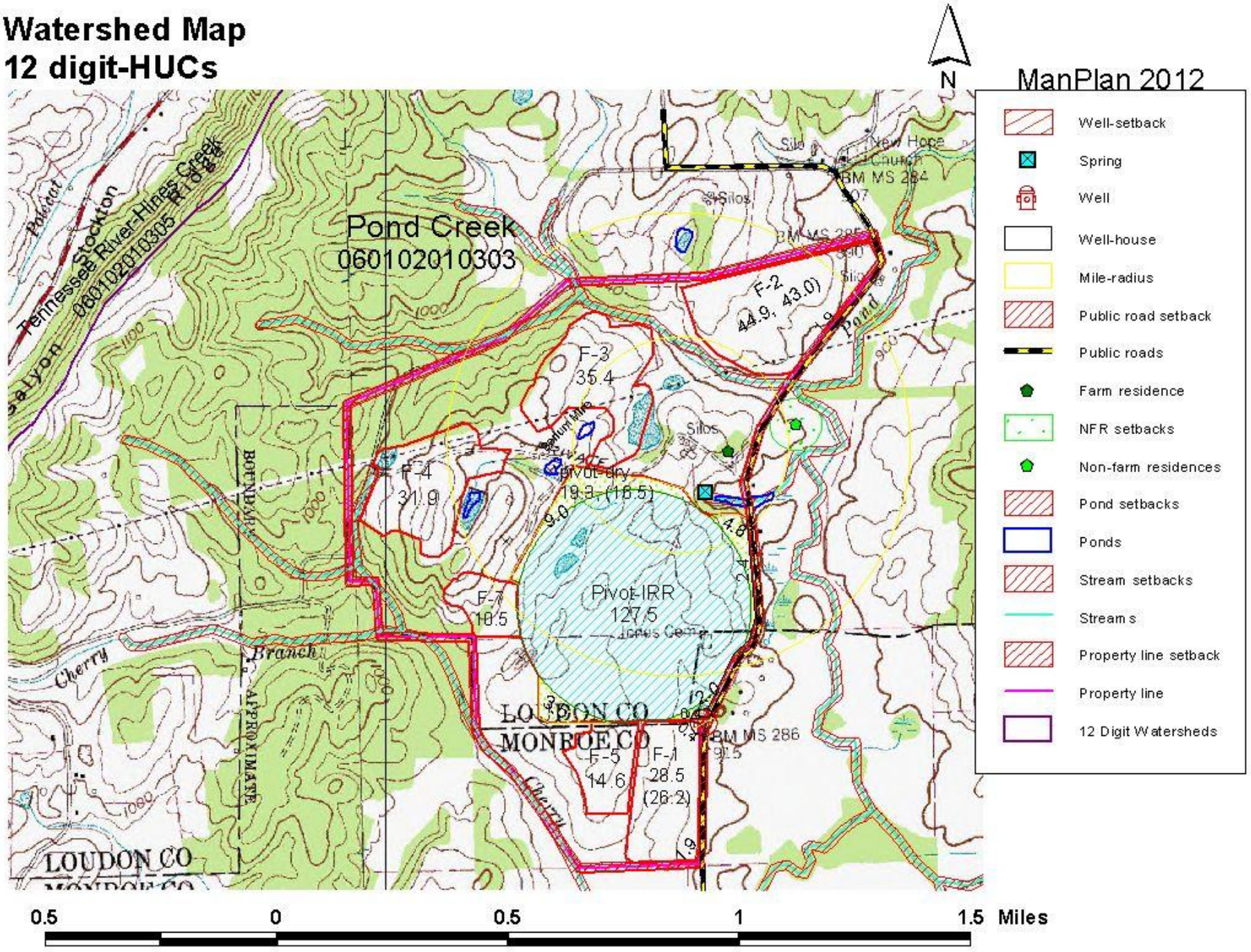
See Earthen Closure Plan in Section 2.

PROPOSED IMPROVEMENTS:

It is recommended to install gutters on the freestall barn and feed shed to reduce the amount of storm water runoff from entering the lots and the storage pond.

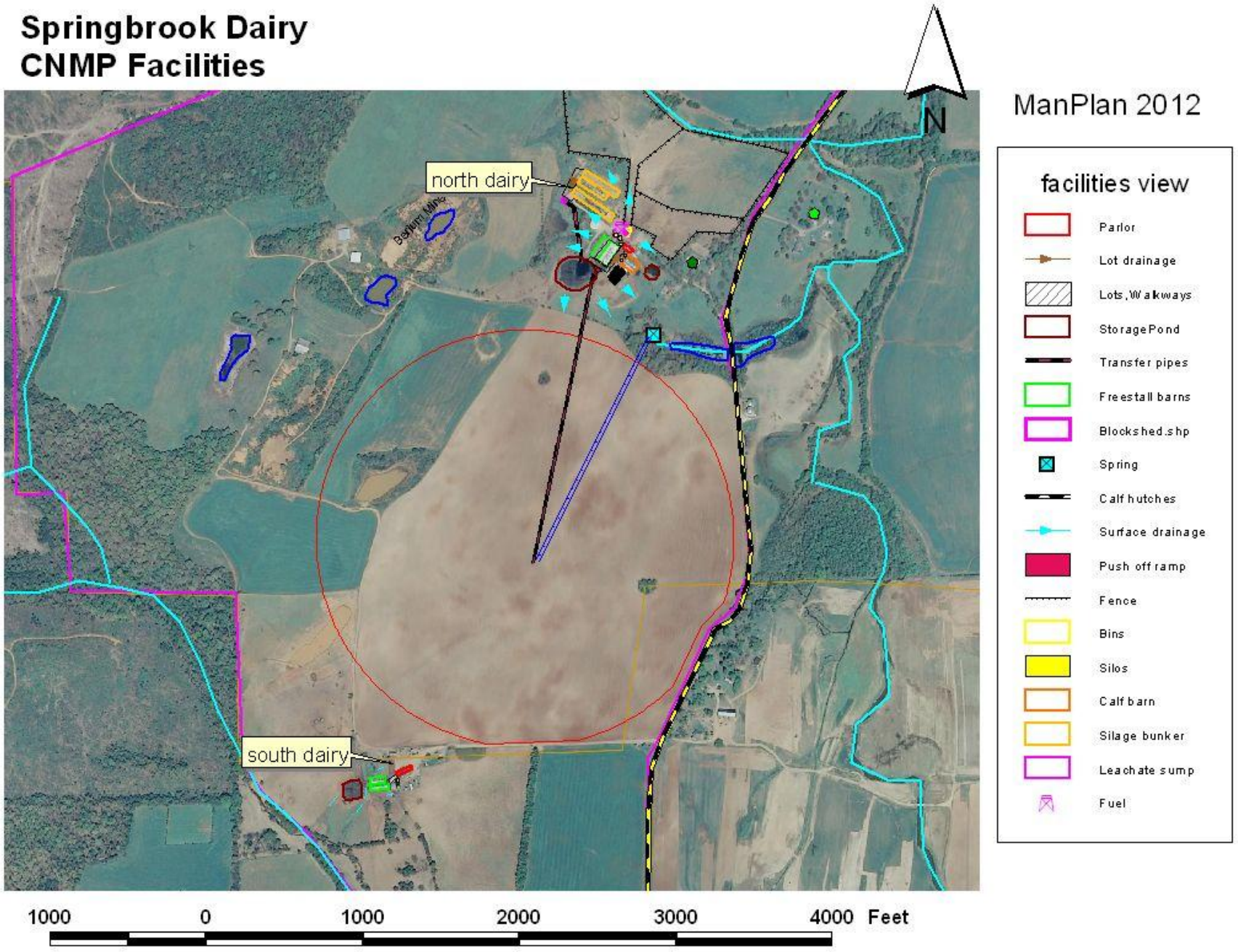
A second earthen storage pond is not used currently but may be used in the future at the south dairy facilities. This storage pond shall be maintained at freeboard or below levels below freeboard so that storage facilities do not discharge. A diversion may be installed to divert clean runoff water away from the storage pond. See maps in Section 2, pages 18 & 19.

Watershed Map
12 digit-HUCs

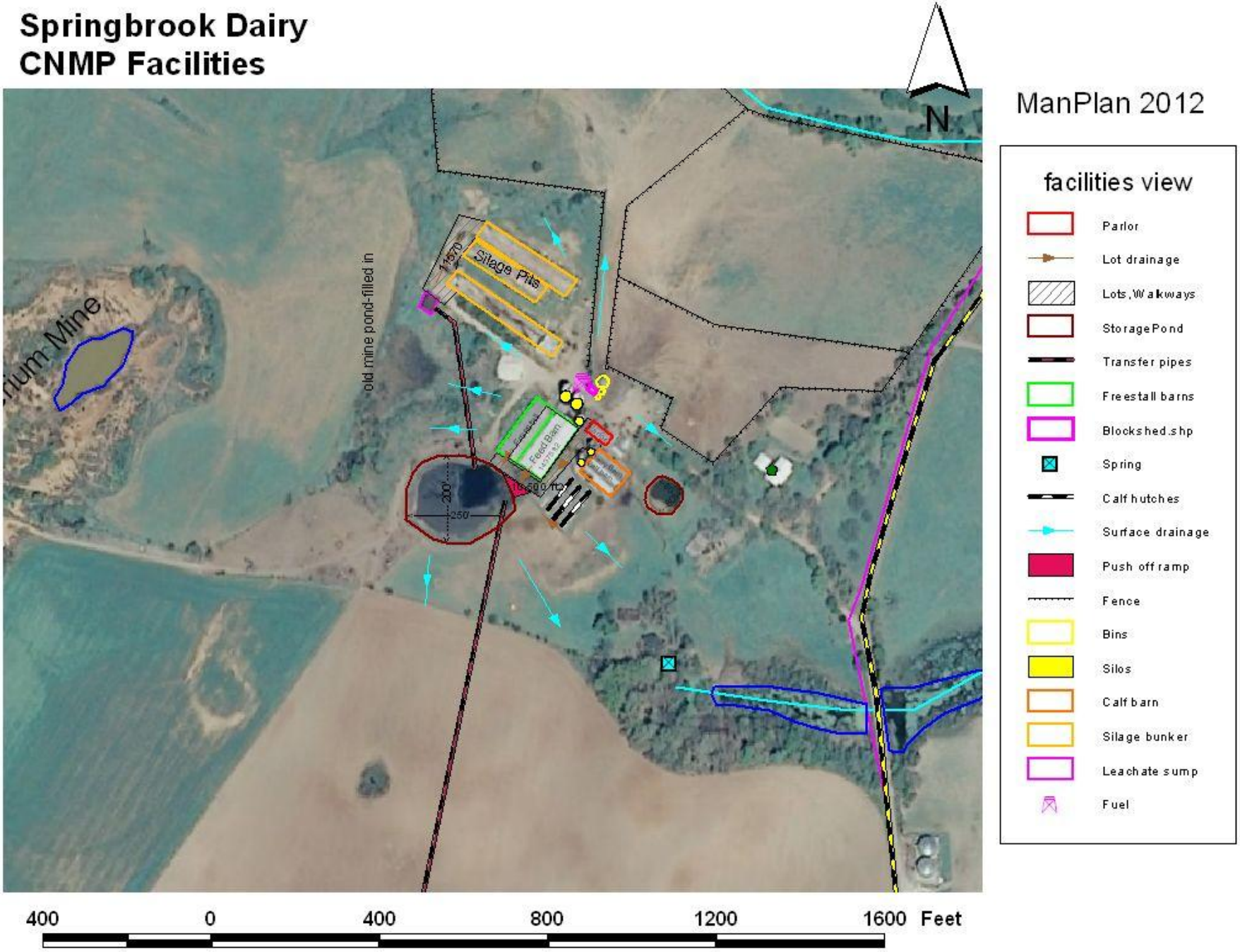


Section 2. Manure and Wastewater Handling and Storage

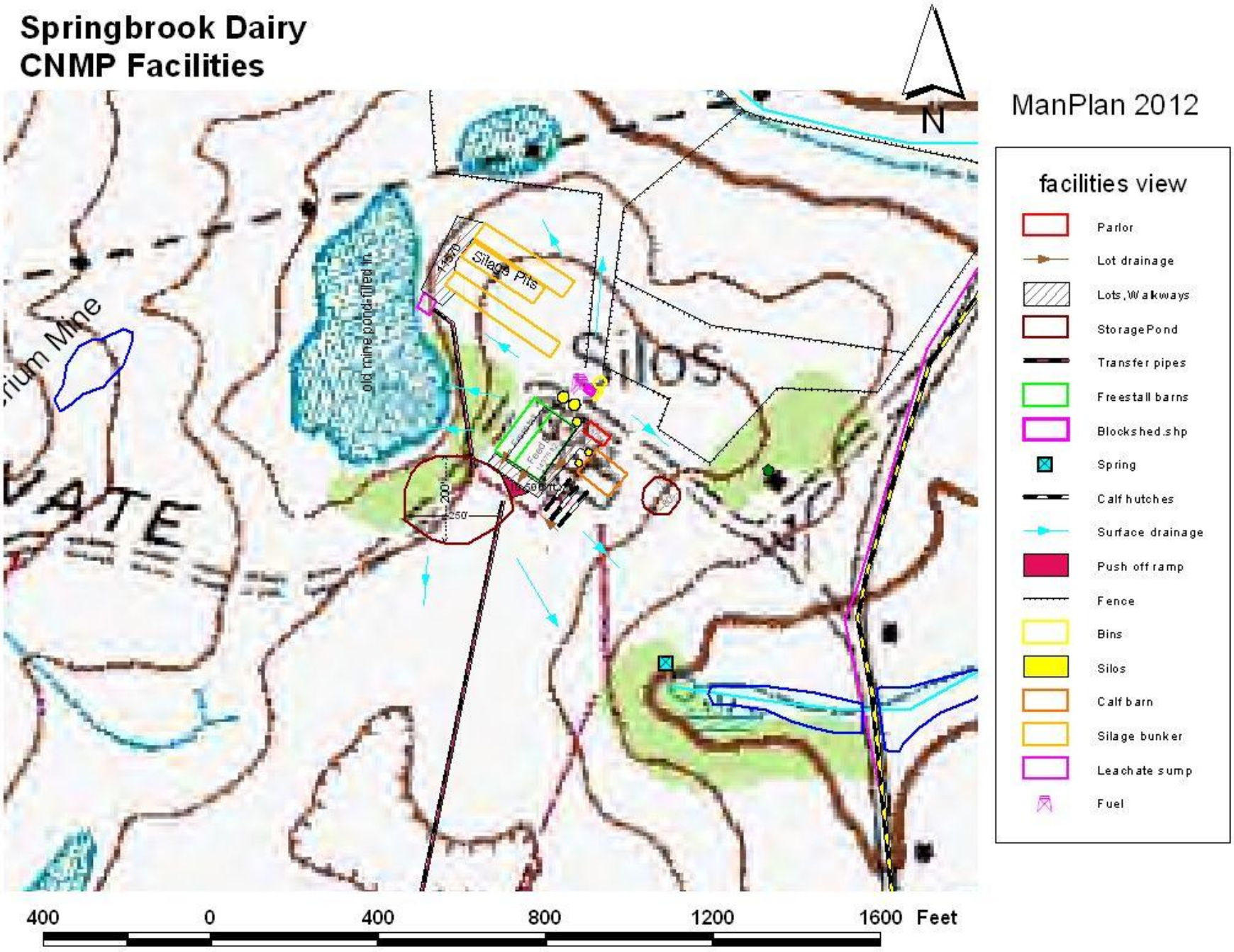
2.1. Map(s) of Production Area



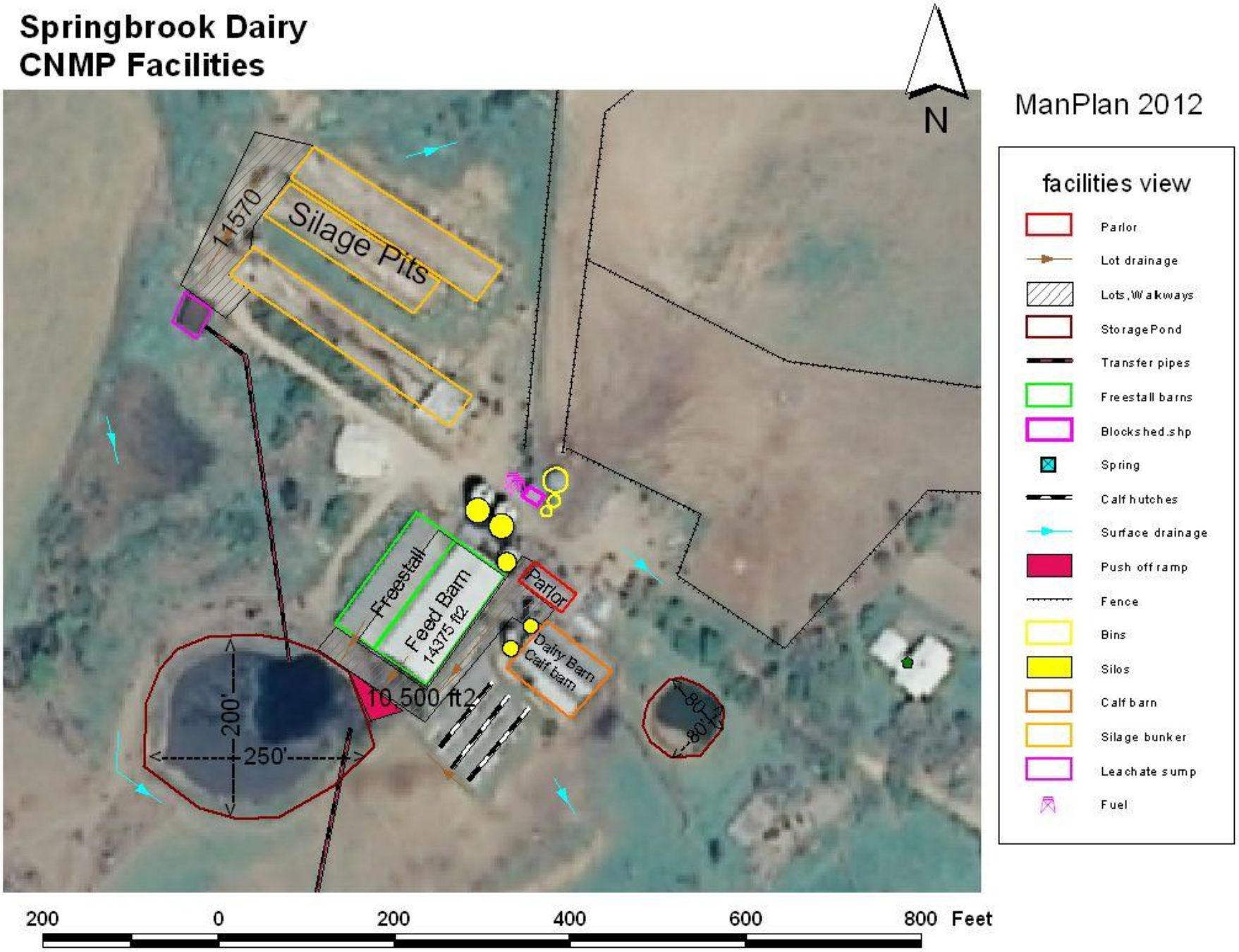
Springbrook Dairy
CNMP Facilities

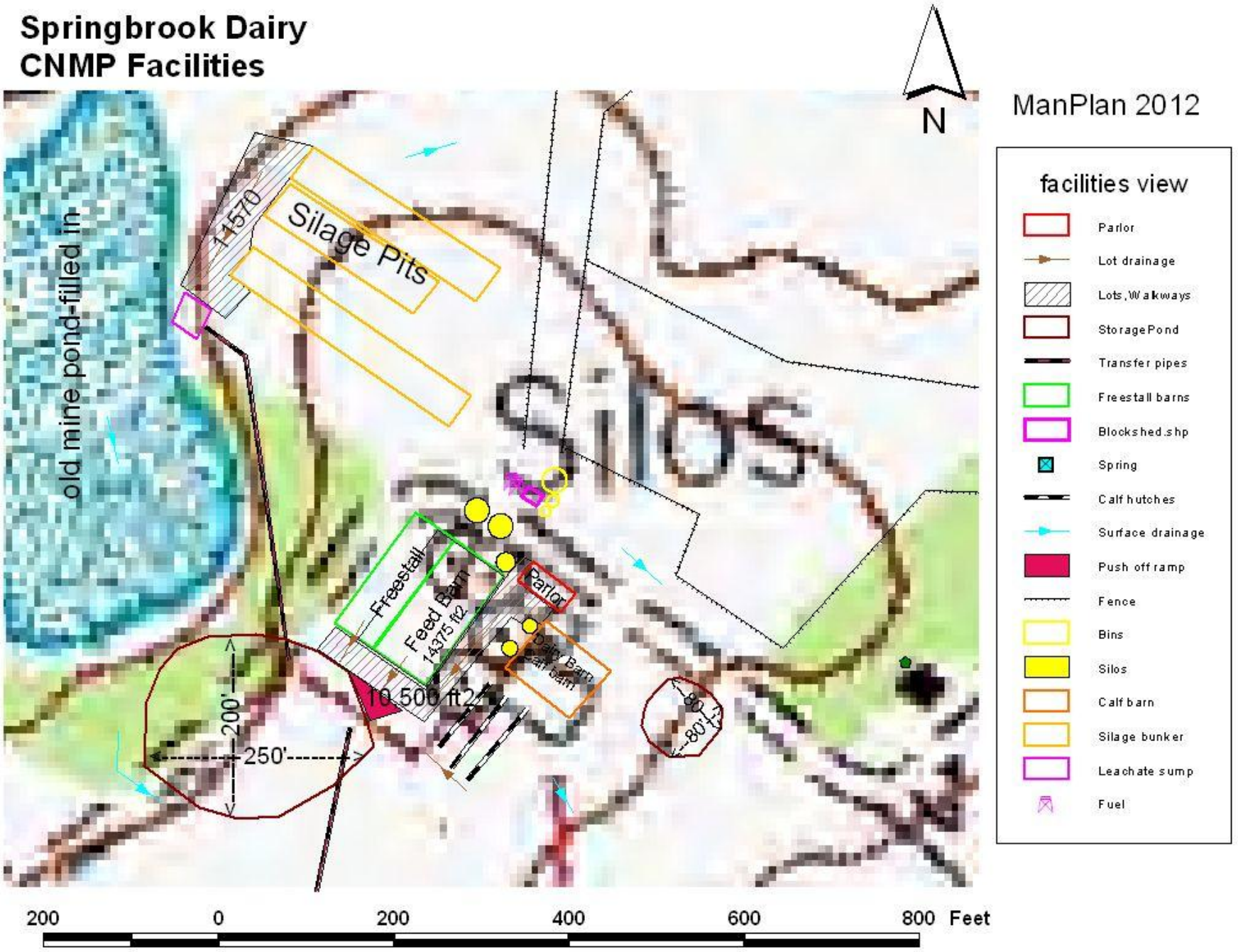


Springbrook Dairy
CNMP Facilities

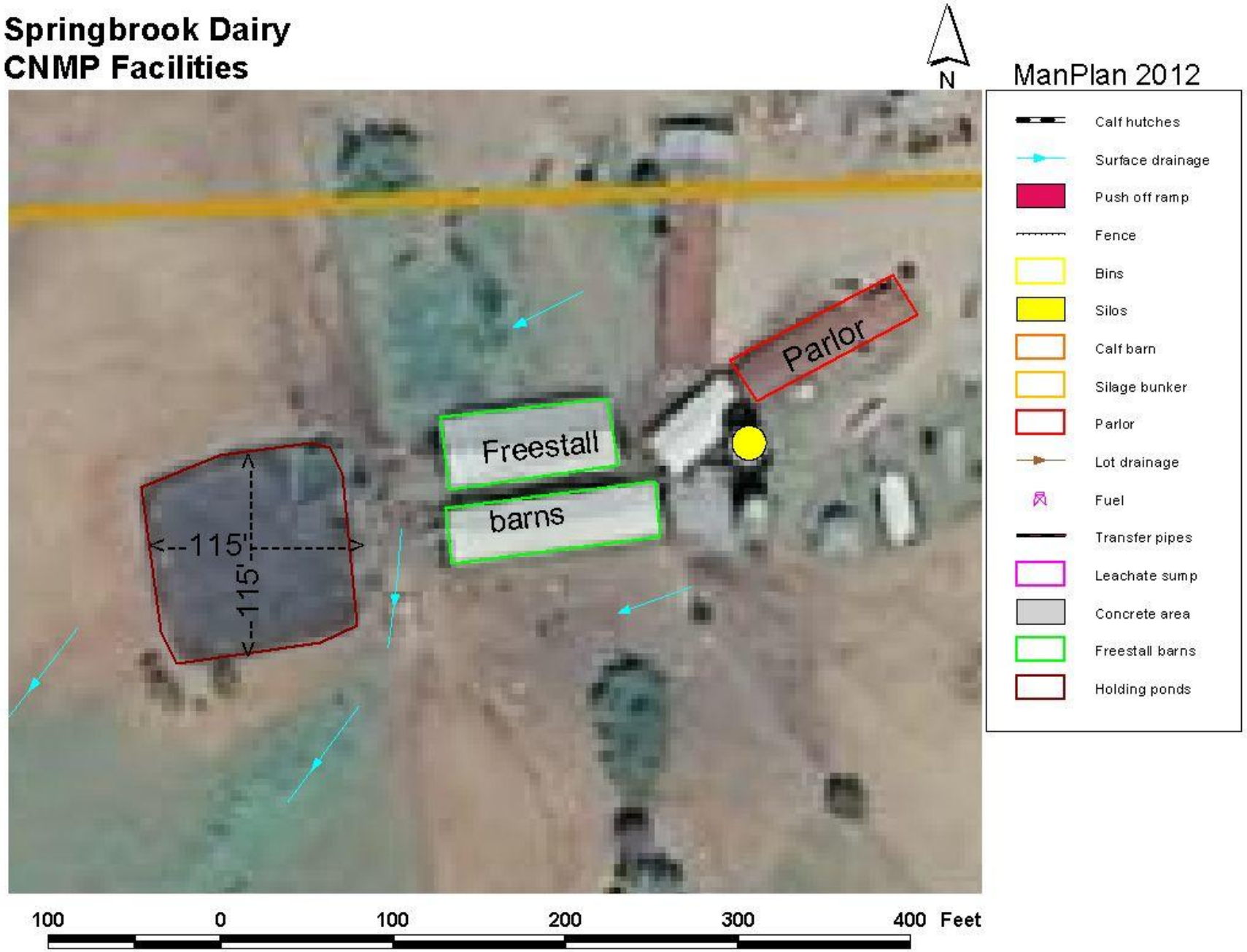


Springbrook Dairy
CNMP Facilities

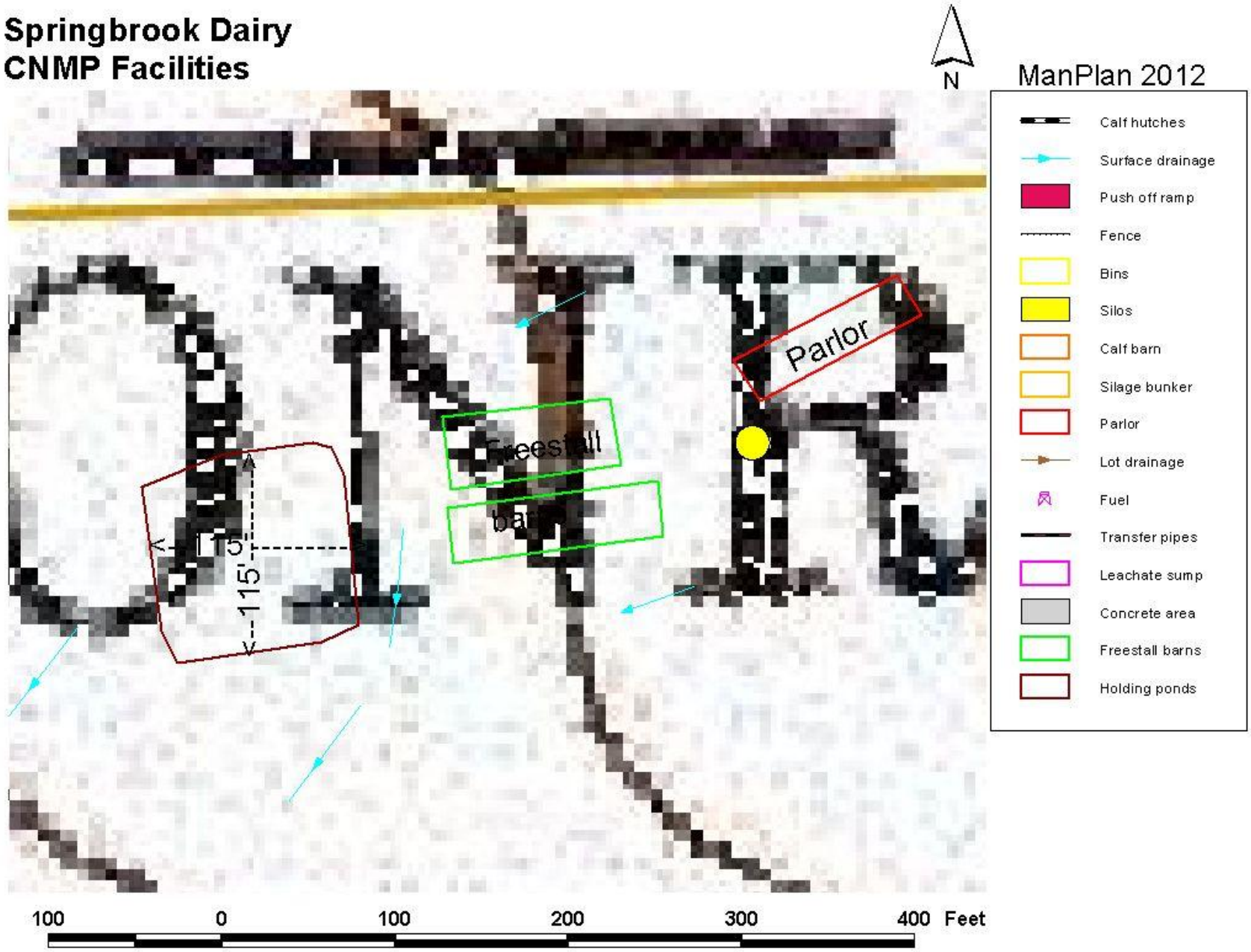



Springbrook Dairy
CNMP Facilities
N
ManPlan 2012
facilities view
Parlor
Lot drainage
Lots, Walkways
Storage Pond
Transfer pipes
Freestall barns
Blockshed.shp
Spring
Calf hutches
Surface drainage
Push off ramp
Fence
Bins
Silos
Calf barn
Silage bunker
Leachate sump
Fuel
old mine pond-filled in
11570
Silage Pits
Silos
Freestall
Feed Barn
14375 ft2
Parlor
Dairy Barn
Calf barn
10,500 ft2
200'
250'
80'
108'
200
0
200
400
600
800 Feet

South Facilities-this facility is closed-(no animals).
Lagoon levels are managed to maintain a minimum of 2 foot of freeboard.



South Facilities-this facility is closed-(no animals).
Lagoon levels are managed to maintain a minimum of 2 foot of freeboard.



2.2 Production Area Conservation Practices
Animal and Manure Resources

Average inventory on the dairy farm includes: 250 lactating cows, with average weights 1200 lbs 40 dry cows, 80 springers and breeding age heifers, and approximately 40 calves weighing less than 250 lbs. Total manure produced estimates were made using the Animal Waste Management program and AWM reports are included in this section. Tables 2-3 and 2-4 on next page summarizes animal inventories and manure storage capacities.

Liquid manure:
Agitation is recommended during pumping in the future to remove solids build-up that may occur. The main storage pond (1) has approximately 6 months of storage capacity for a normal year. The storage pond is agitated prior to spreading to remove solids and minimize sludge build-up. It is estimated that approximately **2,500,000 gallons of liquid manure** from the dairy facilities will be produced annually and applied through the center pivot system.

Liquid manure and wastewater from the milk parlor is drained to storage pond (2) which has approximately 12 months of storage. It is estimated that approximately **200,000 gallons of liquid manure and wastewater** from the parlor will be produced annually and transferred to storage pond 1.

Solid Manure:
All manure is planned to be scraped and drained to the push off ramp into storage pond 1. No solids are normally planned to be applied. Periodically sludge and settled sand may be cleaned out of the bottom of the storage pond. This material will be sampled and analyzed prior to setting application rates on crop fields listed in this CNMP. If needed, sludge and solid manure will be applied to fields in this NMP with a tandem axle side slinger solids-slurry spreader.

2.3. Manure Storage

Storage ID	Type of Storage	Pumpable or Spreadable Capacity	Annual Manure Collected	Maximum Days of Storage
Holding Pond 1	Holding pond	2,000,000 Gal	2,500,000 Gal	292
Parlor Pond	Holding pond	230,000 Gal	200,000 Gal	420

2.4. Animal Inventory

Animal Group	Type or Production Phase	Number of Animals	Average Weight (Lbs)	Confinement Period	Manure Collected (%)	Storage Where Manure Will Be Stored
Dairy Cows	Milk cow (dairy)	250	1,200	Jan Early - Dec Late	45	Holding Pond 1
Parlor	Milk cow (dairy)		1,200	Jan Early - Dec Late	5	Parlor Pond
Heifers	Breeding heifer (dairy)	80	1,000	Jan Early - Dec Late	20	Holding Pond 1
Dry Cows	Dry cow (dairy)	40	1,200	Jan Early - Dec Late	20	Holding Pond 1
Calves	Calf (dairy)	40	200	Jan Early - Dec Late	100	Holding Pond 1

(1) Number of Animals is the average number of animals that are present in the production facility at any one time
(2) If Manure Collected is less than 100%, this indicates that the animals spend a portion of the day outside of the production facility or that the production facility is unoccupied one or more times during the confinement period.

MMP Input Data from AWM for: Springbrook Dairy

Assisted by: ***ManPlan Inc***

Average Annual Manure Production Stored (for MMP "Analysis" tab)

Facility	Manure		Bedding		Wash Water	Flush Water	Runoff and Extr Precip	Rainfall	Annual Throughput Volume w/o 25Yr Rainfall and Runoff	
	Tons	Gallons	Tons	Gallons	Gallons	Gallons	Gallons	Gallons	Tons	Gallons
Storage Pond #1	NA	764086	NA	47800	0	0	1046975.6	413195	**NA**	**2272056.6**
Storage Pond #2	NA	74903	NA	0	0	0	0	135014	**NA**	**209917**
Annual Total	0	838,989	0	47,800	0	0	1,046,976	548,209	**0**	**2,481,974**

Spreadable or Pumpable Capacity (for MMP "Storage" tab)

Facility	Manure		Bedding		Wash Water	Flush Water	Runoff & Extrn Precip	Rainfall	Design Storage Period	Design Volume w/o 25Yr Rainfall and Runoff	
	Tons	Gallons	Tons	Gallons	Gallons	Gallons	Gallons	Gallons	Months	Tons	Gallons
Storage Pond #1	NA	379963	NA	23770	0	0	1176604	312130	6	**NA**	**1892467**
Storage Pond #2	NA	74905	NA	0	0	0	0	135086	12	**NA**	**209991**

Animal Production Data

Animal	Type of Animal	Number	Weight in Lb	Manure Produced per Animal Unit in CF/Day	Total Manure Produced in CF/Day	Annual Manure Produced in CF	Annual Manure Produced in Gal
Calf (330 lb)	Dairy	40	200	1.30	10.40	3,806	28,472
Dry Cow	Dairy	40	1200	0.84	40.32	14,757	110,383
Heifer (970 lb)	Dairy	80	1000	0.90	72.00	26,352	197,113
Milker(100lb Milk)	Dairy	240	1200	1.90	547.20	200,275	1,498,058
Totals		400	N/A	N/A	669.92	245,191	1,834,027

Annual Production vs Storage

Manure Stored			Manure Not Captured		
(CF)	(Gal)	(Lbs)	(CF)	(Gal)	(Lbs)
112164	838987	6729840	133027	995042	7981620

Animal Waste Management Plan Report

prepared for Springbrook Dairy

Designed By: ManPlan Inc

Date: 6/14/2012

Checked By:

Date:

Farm Information

# of Operating Periods: 1 **State:** TN **Data Source:** NRCS-2008

Operating Period: January - December

Climate Data

County: Loudon

Station: LENOIR CITY TN5158

25 Yr - 24 Hr Storm Event: 5.35 inches

Lagoon Loadings:

Rational Design Method:

Barth KVAL: 0

Load Rate for Odor, OCV: 0 lbs VS/cu. ft/day

LRV Max: 0.00625 lbs VS/cu. ft/day

NRCS Design Method:

Anaerobic Load Rate: 0 lbs VS/1000 cu. ft/day

Month	Prec. (in)	Evap. (in)
January	5.08	1.60
February	4.63	1.90
March	5.78	3.00
April	4.43	4.00
May	5.03	4.90
June	4.15	5.50
July	4.45	5.60
August	3.59	5.20
September	3.26	4.30
October	3.05	2.90
November	4.27	1.80
December	5.12	1.70
Total	52.84	42.40

Animal Data

Animal	Type	Quantity	Weight	Manure	VS	TS	Manure	Manure	VS	TS
			lbs	cu.ft/day/AU	lbs/day/AU	lbs/day/AU	cu.ft/day	lbs/day	lbs/day	lbs/day
Calf (330 lb)	Dairy	40	200	1.30	7.70	9.20	10.40	624.0	61.60	73.60
Dry Cow	Dairy	40	1200	0.84	5.60	6.60	40.32	2419.2	268.80	316.80
Heifer (970 lb)	Dairy	80	1000	0.90	7.30	8.50	72.00	4320.0	584.00	680.00
Milker(100lb M	Dairy	240	1200	1.90	12.00	15.00	547.20	32832.0	3456.00	4320.00
Totals		400	N/A	N/A	N/A	N/A	669.92	40195.2	4370.40	5390.40

Location Data

Percent of Manure Deposited in Each Location:

Period **1**

Calf Barn-huts	**Animal Name**	**Percent Manure**
	Milker(100lb Milk)	0
	Heifer (970 lb)	0
	Dry Cow	0
	Calf (330 lb)	100
Feed barn	**Animal Name**	**Percent Manure**
	Calf (330 lb)	0
	Dry Cow	20
	Heifer (970 lb)	20
	Milker(100lb Milk)	25
Freestalls	**Animal Name**	**Percent Manure**
	Dry Cow	0
	Heifer (970 lb)	0
	Milker(100lb Milk)	20
	Calf (330 lb)	0
Parlor	**Animal Name**	**Percent Manure**
	Heifer (970 lb)	0
	Dry Cow	0
	Milker(100lb Milk)	5
	Calf (330 lb)	0
Totals	**Animal Name**	**Percent Manure**
	Milker(100lb Milk)	50
	Calf (330 lb)	100
	Dry Cow	20
	Heifer (970 lb)	20

Additions Data

Waste Water VS Loading: 12.9

Operating Period: 1

Location	Wash Water	Flush Water	Bedding	Amount
	gal/day	gal/day		lbs/day
Calf Barn-huts	0.00	0.00	Sawdust - Shavings	200.00
Parlor	0.00	0.00		0.00
Feed barn	0.00	0.00		0.00
Freestalls	0.00	0.00	Sand	500.00

Runoff Data

Runoff Volume Method: Calculate Monthly Runoff Volumes with AWM

Pervious Watershed Area: 0 acres

Pervious Curve Number Storm 90

Pervious Curve Number Monthly 90 (1 day), 77 (30 day)

Impervious Area: 36445 sq. ft

25 Year Pervious: 0.00 cu. ft

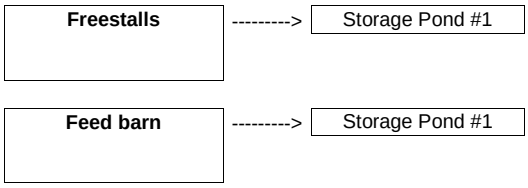
25 Year Impervious: 15530.00 cu. ft

25 Year Total: 15530.00 cu. ft

Runoff Volumes (1000 cu. ft.)

Month	Pervious	Impervious	Month Total
January	0.00	13.69	13.69
February	0.00	12.34	12.34
March	0.00	15.80	15.80
April	0.00	11.74	11.74
May	0.00	13.54	13.54
June	0.00	10.90	10.90
July	0.00	11.80	11.80
August	0.00	9.22	9.22
September	0.00	8.24	8.24
October	0.00	7.62	7.62
November	0.00	11.26	11.26
December	0.00	13.82	13.82
Total	0.00	139.98	139.98

Management Train



Parlor	--------->	Storage Pond #2
Calf Barn-huts	--------->	Storage Pond #1
Runoff	--------->	Storage Pond #1

Facility Volume Data

Operating Period 1

Facility	Manure	Wash Water	Flush Water	Bedding	Total Vol
Storage Pond #2	27.36	0.00	0.00	0.00	27.36
Storage Pond #1	279.10	0.00	0.00	17.46	296.56

Waste Facilities

Storage Pond #1

Max. Storage Vol. Method: Cum. Storage Vol

Storage Months: 6 months **Critical Months:** Nov - Apr

Design Dimensions

Shape: Rectangle
Sideslope: 2:1
Storage Depth: 15.0 ft;
Freeboard: 2.0 ft
Permament Additional Storage 8.93 ft

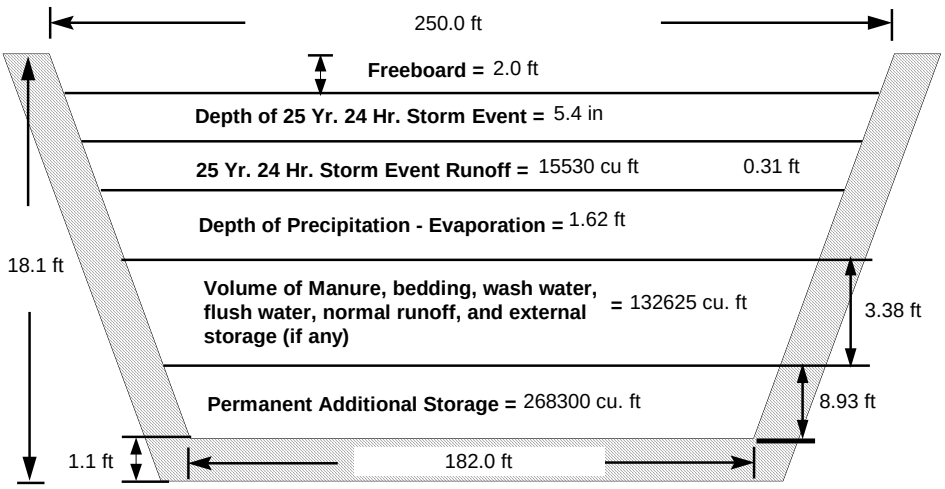
Top Length: 250.0 ft
Bottom Length: 182.0 ft
Top Width: 200.0 ft
Bottom Width: 132.0 ft
Bot Dimensions 132.0 x 182.0 ft
TopDimensions: 200.0 x 250.0 ft

Design Quantities

25Yr24Hr Storm Depth: 5.4 in
Prec Minus Evap Depth: 1.62 ft
Volume Required (Wastes): 132625 cu. ft

Soil Liner

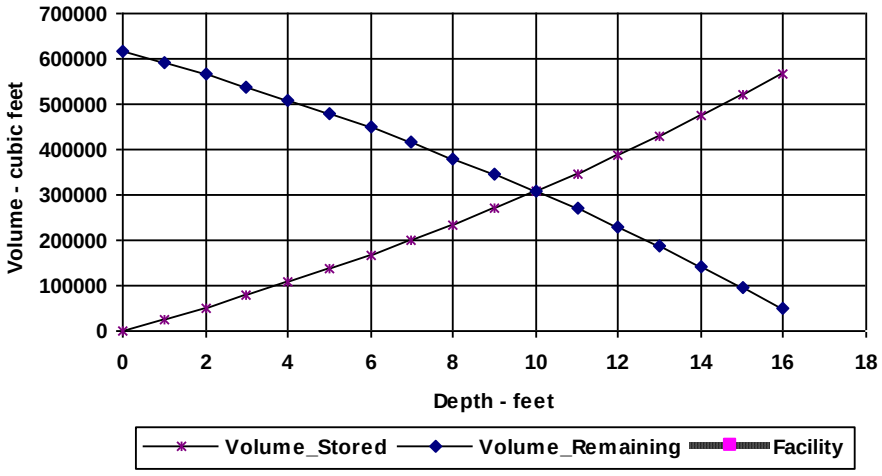
Liner Depth: 1.1 ft
Liquid Depth: 13.5 ft 9
Permeability: .0001 ft/day
Specific Discharge: .0013 ft3/ft2/day



Water Budget (1000 cu. ft.)

Month	Runoff	Withdrawal	Waste	Prec - Evap	Ext Prec	CumStorageVol
January	13.69	☐	9.19	16.47	0.00	111.37
February	12.34	☐	8.60	13.71	0.00	146.03
March	15.80	☐	9.19	15.27	0.00	186.30
April	11.74	☑	8.90	6.71	0.00	213.65
May	13.54	☐	9.19	6.57	0.00	29.30
June	10.90	☐	8.90	1.14	0.00	50.24
July	11.80	☑	9.19	2.09	0.00	73.32
August	9.22	☐	9.19	-0.31	0.00	18.10
September	8.24	☐	8.90	0.95	0.00	36.19
October	7.62	☑	9.19	4.19	0.00	57.20
November	11.26	☐	8.90	12.51	0.00	32.66
December	13.82	☐	9.19	16.34	0.00	72.02

Stage Storage Curve



Storage Pond #2

Max. Storage Vol. Method: Cum. Storage Vol

Storage Months: 12 months **Critical Months:** Nov - Apr

Design Dimensions

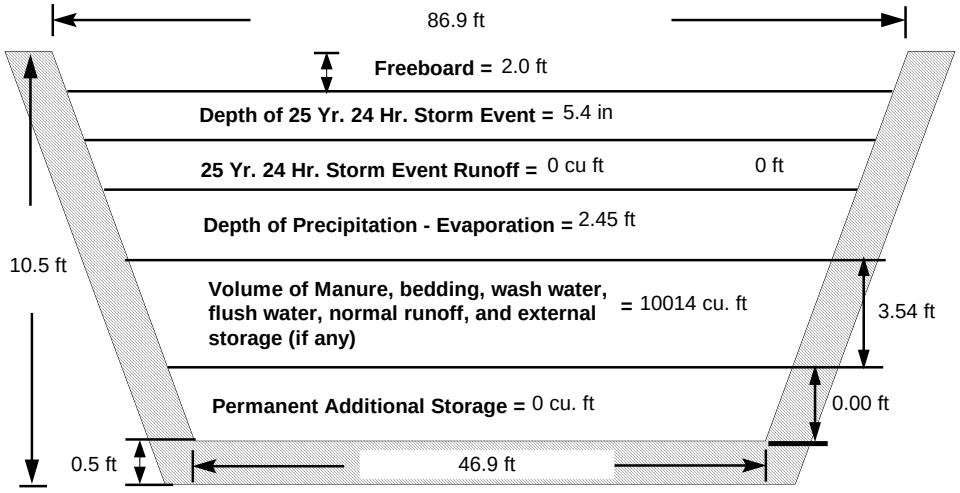
Shape:	Rectangle	**Top Length:**	86.9 ft
Sideslope:	2:1	**Bottom Length:**	46.9 ft
Storage Depth:	8.0 ft;	**Top Width:**	85.0 ft
Freeboard:	2.0 ft	**Bottom Width:**	45.0 ft
		Bot Dimensions	45.0 x 46.9 ft
Permament Additional Storage	0.00 ft	**TopDimensions:**	85.0 x 86.9 ft

Design Quantities

25Yr24Hr Storm Depth:	5.4 in
Prec Minus Evap Depth:	2.45 ft
Volume Required (Wastes):	10014 cu. ft

Soil Liner

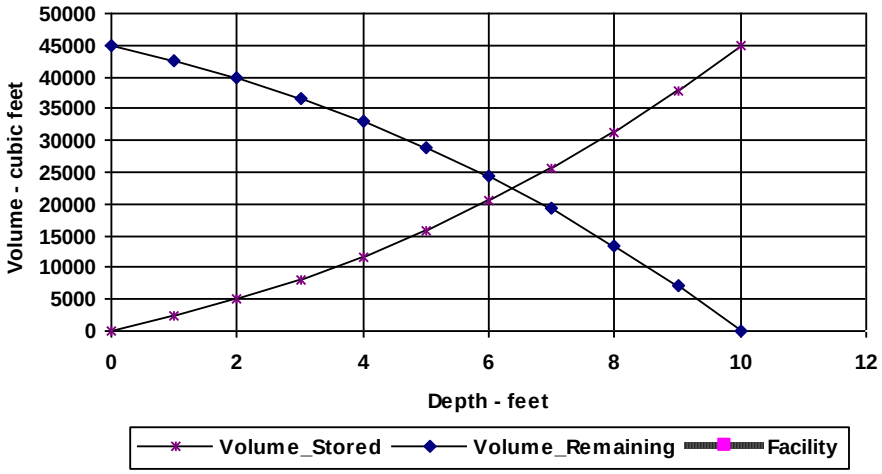
Liner Depth:	0.5 ft	**Permeability:**	.0001 ft/day
Liquid Depth:	4.41 ft	**Specific Discharge:**	.001 ft3/ft2/day



Water Budget (1000 cu. ft.)

Month	Runoff	Withdrawal	Waste	Prec - Evap	Ext Prec	CumStorageVol
January	0	☐	0.85	2.58	0.00	14.06
February	0	☐	0.79	2.20	0.00	17.06
March	0	☐	0.85	2.53	0.00	20.44
April	0	☐	0.82	1.36	0.00	22.62
May	0	☐	0.85	1.42	0.00	24.90
June	0	☐	0.82	0.68	0.00	26.40
July	0	☑	0.85	0.83	0.00	28.07
August	0	☐	0.85	0.44	0.00	1.28
September	0	☐	0.82	0.54	0.00	2.65
October	0	☐	0.85	0.89	0.00	4.38
November	0	☐	0.82	2.01	0.00	7.22
December	0	☐	0.85	2.57	0.00	10.64

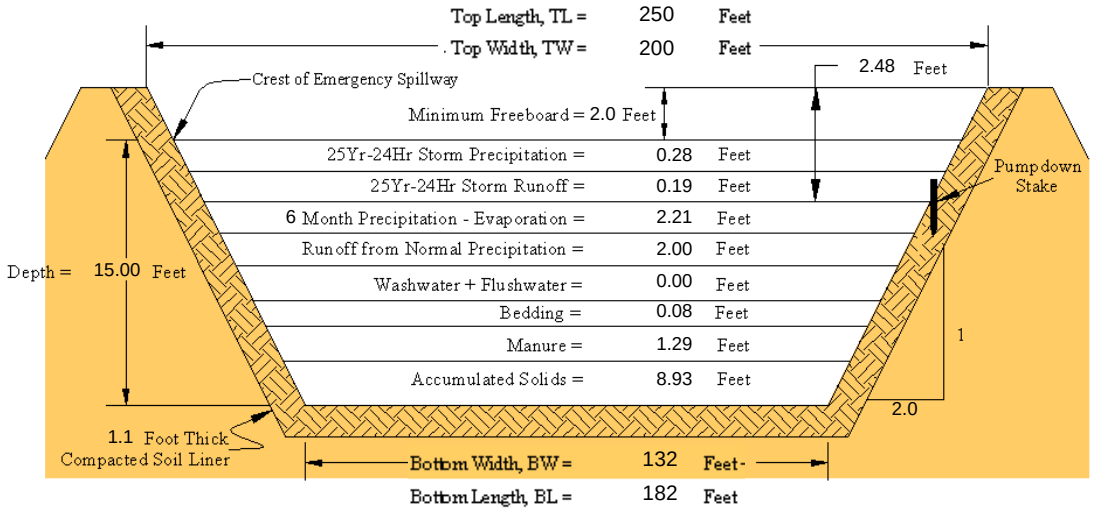
Stage Storage Curve



AWM
Waste Storage Pond Data for: Springbrook Dairy

Designed by: ManPlan Inc

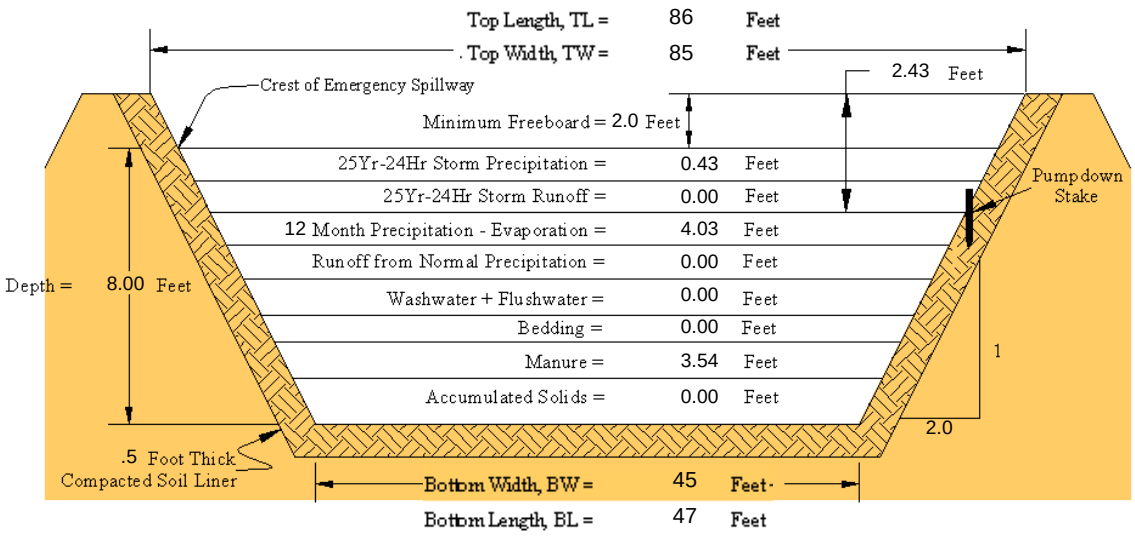
Facility	**Rectangular Storage Pond #1**			
Storage Period	6	***Months***		
Manure & External Effluent	50,797	***Cubic Feet***	379,962	***Gallons***
Bedding	3,178	***Cubic Feet***	23,771	***Gallons***
FlushWater	0	***Cubic Feet***	0	***Gallons***
WashWater	0	***Cubic Feet***	0	***Gallons***
Runoff from Drainage Area				
25Yr-24Hr Storm	15,530	***Cubic Feet***	116,164	***Gallons***
Normal Rainfall	78,650	***Cubic Feet***	588,302	***Gallons***
Rainfall on Pond Surface				
25Yr-24Hr Storm	22,500	***Cubic Feet***	168,300	***Gallons***
Normal Rainfall minus Evaporation	81,021	***Cubic Feet***	606,035	***Gallons***
Accumulated Solids	268,300	***Cubic Feet***	2,006,884	***Gallons***
Design Operating Volume ..	213,646	***Cubic Feet***	1,598,070	***Gallons***
Total Storage Volume	251,676	***Cubic Feet***	1,882,534	***Gallons***
Ramp Volume (if applicable)	0	***Cubic Feet***		
Structural Volume (includes effects of ramp if present)	616,103	***Cubic Feet***		



AWM
Waste Storage Pond Data for: Springbrook Dairy

Designed by: ManPlan Inc

Facility	**Rectangular Storage Pond #2**			
Storage Period	12	***Months***		
Manure & External Effluent	10,014	***Cubic Feet***	74,905	***Gallons***
Bedding	0	***Cubic Feet***	0	***Gallons***
FlushWater	0	***Cubic Feet***	0	***Gallons***
WashWater	0	***Cubic Feet***	0	***Gallons***
Runoff from Drainage Area 25Yr-24Hr Storm	0	***Cubic Feet***	0	***Gallons***
Normal Rainfall	0	***Cubic Feet***	0	***Gallons***
Rainfall on Pond Surface 25Yr-24Hr Storm	3,324	***Cubic Feet***	24,863	***Gallons***
Normal Rainfall minus Evaporation	18,060	***Cubic Feet***	135,086	***Gallons***
Accumulated Solids	0	***Cubic Feet***	0	***Gallons***
Design Operating Volume ..	28,074	***Cubic Feet***	209,991	***Gallons***
Total Storage Volume	31,398	***Cubic Feet***	234,854	***Gallons***
Ramp Volume (if applicable)	0	***Cubic Feet***		
Structural Volume (includes effects of ramp if present)	44,818	***Cubic Feet***		



OPERATION AND MAINTENANCE GUIDELINES for Storage Pond #1

Landowner: Springbrook Dairy

Designed by: ManPlan Inc

Manure storage ponds are designed to contain all of the manure, bedding, and water that is generated by the site. Care should be exercised so that foreign objects or frozen material are excluded from the facility. It is wise to dedicate a portion of the feedlot as a place to stack frozen materials until they thaw and can be added to the facility.

Excessive bedding can also cause management problems with a holding pond. Granular materials such as limestone and sand will settle to the bottom and can cause problems with agitation processes and with equipment.

Manure storage ponds experience some biological activity and can generate undesirable odors. This can be minimized if a crust forms on the surface. Some crusts form naturally and others can be encouraged by blowing chopped straw or bedding on the surface.

Adequate time needs to be allocated for emptying the storage pond. A marking post should be placed in the pond indicating that one half of the volume has been used when the facility contains 10 feet of material and three fourths of the capacity has been used when there is 14.1 feet in the facility.

This structure has been sized for 6 months of storage and will contain up to 4608447 gallons of material. Prior to emptying the manure storage pond, it should be initially agitated for at least 1 day. Additional agitation may be needed during the emptying process.

To empty the waste storage pond using a 4000 gallon tank spreader, approximately 1152 loads will be required. Assuming 3 loads per hour, over 384 hours would be required to empty the storage pond.

Using irrigation equipment pumping 900 gallon per minute, emptying the waste storage pond would require approximately 85 hours of pumping time each time. (not including agitation or moving of equipment)

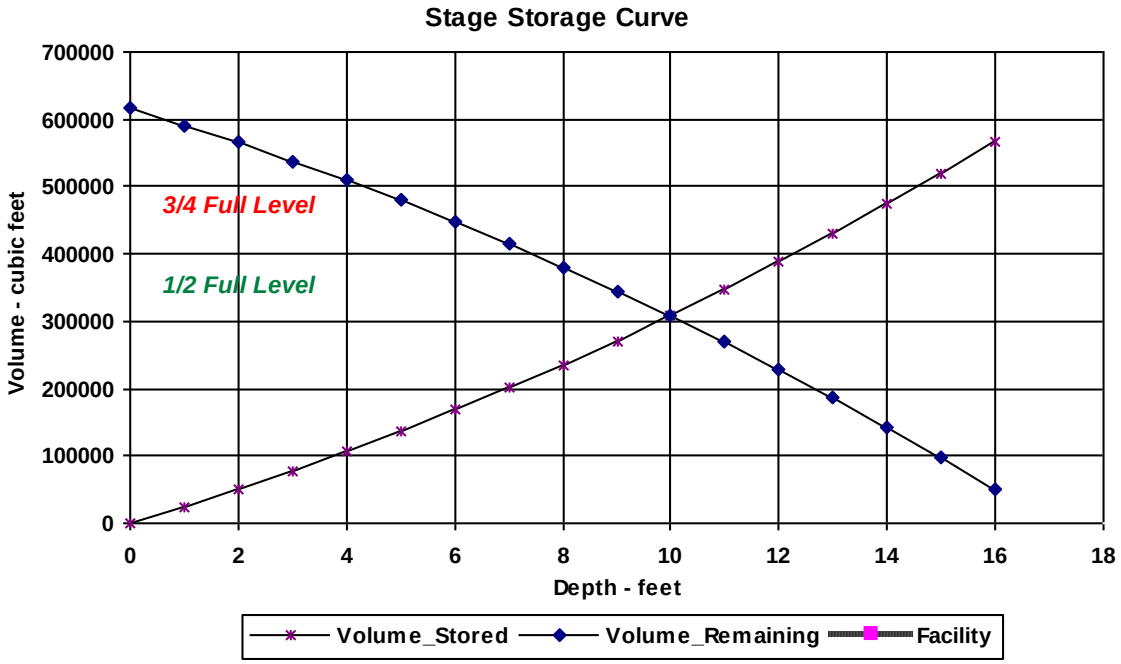
OPERATION AND MAINTENANCE GUIDELINES for Storage Pond #1

Landowner: Springbrook Dairy

Designed by: ManPlan Inc

Ground conditions need to be evaluated prior to applying the waste. Excessively wet conditions or excessively dry conditions should be avoided, since waste may either run off or flow thru cracks to subsurface drainage systems. Wind conditions should be observed to avoid drift and odor problems. Subsurface outlets and downstream drainage should be constantly monitored.

Maximum application rates should consider the intake capability of the particular soils that the waste is applied on. When irrigating, a maximum application rate of 1 inches is recommended for most soils. Please check your Comprehensive Nutrient Management Plan (CNMP) for application rates and dates.



OPERATION AND MAINTENANCE GUIDELINES for Storage Pond #2

Landowner: Springbrook Dairy

Designed by: ManPlan Inc

Manure storage ponds are designed to contain all of the manure, bedding, and water that is generated by the site. Care should be exercised so that foreign objects or frozen material are excluded from the facility. It is wise to dedicate a portion of the feedlot as a place to stack frozen materials until they thaw and can be added to the facility.

Excessive bedding can also cause management problems with a holding pond. Granular materials such as limestone and sand will settle to the bottom and can cause problems with agitation processes and with equipment.

Manure storage ponds experience some biological activity and can generate undesirable odors. This can be minimized if a crust forms on the surface. Some crusts form naturally and others can be encouraged by blowing chopped straw or bedding on the surface.

Adequate time needs to be allocated for emptying the storage pond. A marking post should be placed in the pond indicating that one half of the volume has been used when the facility contains 5.9 feet of material and three fourths of the capacity has been used when there is 8.3 feet in the facility.

This structure has been sized for 12 months of storage and will contain up to 335241 gallons of material. Prior to emptying the manure storage pond, it should be initially agitated for at least 1 day. Additional agitation may be needed during the emptying process.

To empty the waste storage pond using a 4000 gallon tank spreader, approximately 83 loads will be required. Assuming 3 loads per hour, over 27 hours would be required to empty the storage pond.

Using irrigation equipment pumping 900 gallon per minute, emptying the waste storage pond would require approximately 6 hours of pumping time each time. (not including agitation or moving of equipment)

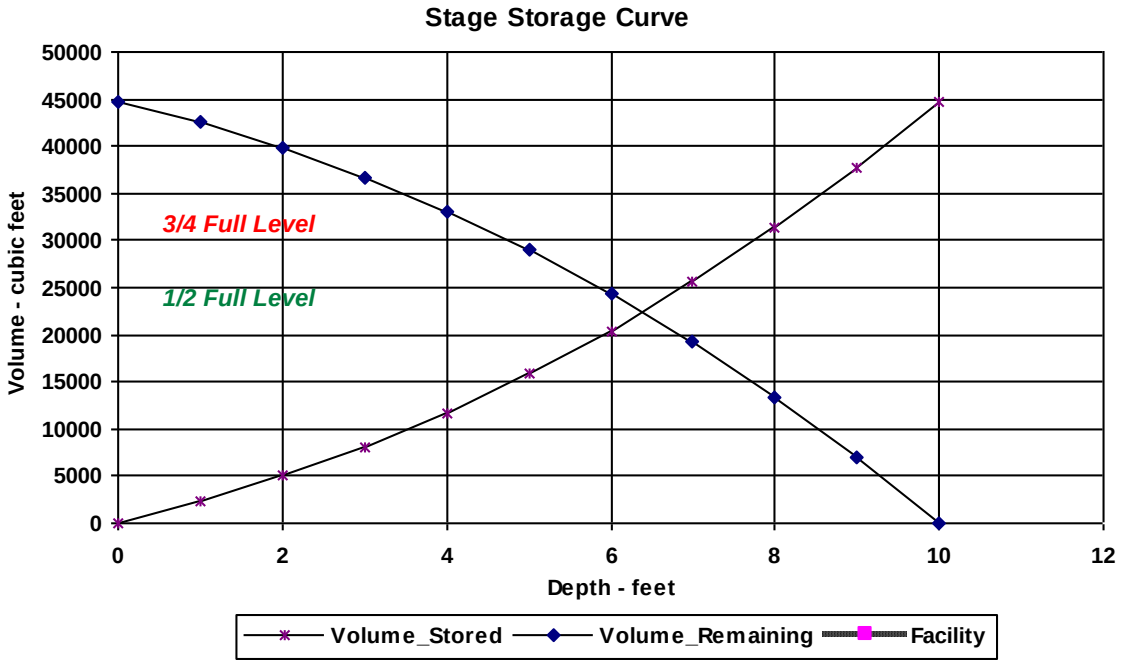
OPERATION AND MAINTENANCE GUIDELINES for Storage Pond #2

Landowner: Springbrook Dairy

Designed by: ManPlan Inc

Ground conditions need to be evaluated prior to applying the waste. Excessively wet conditions or excessively dry conditions should be avoided, since waste may either run off or flow thru cracks to subsurface drainage systems. Wind conditions should be observed to avoid drift and odor problems. Subsurface outlets and downstream drainage should be constantly monitored.

Maximum application rates should consider the intake capability of the particular soils that the waste is applied on. When irrigating, a maximum application rate of 1 inches is recommended for most soils. Please check your Comprehensive Nutrient Management Plan (CNMP) for application rates and dates.



2.5. Normal Mortality Management

To decrease non-point source pollution of surface and ground water resources, reduce the impact of odors that result from improperly handled animal mortality, and decrease the likelihood of the spread of disease or other pathogens, approved handling and utilization methods shall be implemented in the handling of normal mortality losses. If on-farm storage or handling of animal mortality is done, NRCS Standard 316, Animal Mortality Facility, will be followed for proper management of dead animals. (See reference section)

Plan for Proper Management of Dead Animals

Mortalities are normally buried in the old barium mine area. It is a priority of the operation to handle mortalities promptly, removing them from the facilities as soon as possible after discovery and placing them in a burial pit.

Additional discussion of contingency planning for proper animal disposal in case of catastrophic deaths and can be found in Section 3 under the Emergency Action Plan.

Sending mortalities to a licensed landfill or composting on site are alternative disposal methods. Mortalities are covered with approximately 2 feet of sawdust, straw and/or bedded manure between each layer of mortalities. The compost should be turned at least twice during the composting process. Finished compost has little odor and is high in plant nutrients and can be land applied with regular litter.

When soil conditions are proper mortalities may be buried per TN-316 bulletin, “Emergency Disposal of Dead Animals”

2.6. Planned Manure Exports off the Farm

Month-Year	Manure Source	Amount	Receiving Operation	Location

(None)

2.7. Planned Manure Imports onto the Farm

Month-Year	Manure's Animal Type	Amount	Originating Operation	Location

(None)

2.8. Planned Internal Transfers of Manure

Month-Year	Manure Source	Amount	Manure Destination
Jul 2012	Parlor Pond	200,000 Gal	Holding Pond 1
Jul 2013	Parlor Pond	200,000 Gal	Holding Pond 1
Jul 2014	Parlor Pond	200,000 Gal	Holding Pond 1
Jul 2015	Parlor Pond	200,000 Gal	Holding Pond 1
Jul 2016	Parlor Pond	200,000 Gal	Holding Pond 1

Section 3. Farmstead Safety and Security

3.1. Emergency Response Plan

In Case of an Emergency Storage Facility Spill, Leak or Failure

Implement the following first containment steps:

a. Stop all other activities to address the spill.
b. Stop the flow. For example, use skid loader or tractor with blade to contain or divert spill or leak.
c. Call for help and excavator if needed.
d. Complete the clean-up and repair the necessary components.
e. Assess the extent of the emergency and request additional help if needed.

In Case of an Emergency Spill, Leak or Failure during Transport or Land Application

Implement the following first containment steps:

a. Stop all other activities to address the spill and stop the flow.
b. Call for help if needed.
c. If the spill posed a hazard to local traffic, call for local traffic control assistance and clear the road and roadside of spilled material.
d. Contain the spill or runoff from entering surface waters using straw bales, saw dust, soil or other appropriate materials.
e. If flow is coming from a tile, plug the tile with a tile plug immediately.
f. Assess the extent of the emergency and request additional help if needed.

Farm Information

Farm Name	**Springbrook Dairy Farm**
Address	**Farm Address: 4859 New Hope Road Sweetwater, TN 37874** **Mailing address: 4859 New Hope Road Sweetwater, TN 37874**
Farm Phone	**Jason Smith: 865-382-0375**
Permit #	
Directions to Farm	A Sweetwater, TN 1. Head **northeast** on **N Main St** toward **Biggs St** — go 0.5 mi, total 0.5 mi 2. Take the 3rd left onto **TN-322 W/Oakland Rd** — About 5 mins — go 2.9 mi, total 3.4 mi 3. Keep right at the fork — go 0.2 mi, total 3.6 mi 4. Turn right onto **Pond Creek Rd** — About 4 mins — go 1.6 mi, total 5.3 mi 5. Turn left onto **New Hope Rd** — About 3 mins — go 1.2 mi, total 6.5 mi B New Hope Rd

Emergency Contacts

	Name	Emergency Phone	Cell Phone
Farm Owner/Manager	**Jason Smith**	**865-382-0375**	**865-382-0375**
Sheriffs Office **Monroe County** **Loudon County**	 **Bill Bivens** **Tony Aikens**	**911** **423-442-3911** **865-382-0375**	
Fire Department	**Sweetwater Fire Department**	**911** **423-337-6880**	
Ambulance	**Athens**	**911** **423-745-6666**	
Excavation Equipment: Backhoe, Dozer	**Creative Remodeling & Design Inc**	**866-496-8648**	
Electrician	**Spectrum Electric, Inc Sweetwater**	**423-351-9100**	

Agency Contacts

Contact Agency	Person	Day Phone	Emergency Number
TWRA - Tenn. Wildlife Resources Agency			**(800) 890 TENN or (800) 890-8366**
TDEC-Environmental Assistance Center			**(888) 891-8332**
Monroe County Sheriffs Office **Loudon County**	**Bill Bivens** **Tony Aikens**	**911** **423-442-3911** **865-382-0375**	**911**
State Veterinarian: (If mortality issues)	**Dr. Charles Hatcher, Nashville, TN**	**(615) 837-5120**	
UT Extension Loudon, TN		**865-458-5612** **865-458-5999 fax**	

Be prepared to provide the following information:

a. Your name and contact information.
b. Farm location (driving directions) and other pertinent information.
c. Description of emergency.
d. Estimate of the amounts, area covered, and distance traveled.
e. Whether manure has reached surface waters or major field drains.
f. Whether there is any obvious damage: employee injury, fish kill, or property damage.
g. Current status of containment efforts.

3.2. Biosecurity Measures

Biosecurity is critical to protecting livestock and poultry operations. Visitors must contact and check in with the producer before entering the operation or any production or storage facility.

WISCONSIN VETERINARY DIAGNOSTIC LABORATORY

BIOSECURITY FOR DAIRY FARMS

Introduction

Outbreaks of infectious disease have shown that it pays to be conscientious about preventing and controlling infectious disease on livestock operations. This concept is known as biosecurity. Biosecurity refers to management practices that reduce the chances infectious diseases will be carried onto the farm by animals or people. Biosecurity also reduces the spread of infectious disease on farms.

Animal + infectious agent + environment = disease

All infectious diseases result from the interplay between the animal and its ability to resist disease (its immunity), an infectious agent (bacteria, viruses and parasites) and the environment. For example, producers can prevent some diseases by using vaccination to increase immunity. Producers can also prevent disease by keeping infectious agents from coming onto their farm. If an infectious agent is already on the farm, producers can try to eradicate it or control its spread.

Strategic vaccination

Vaccination is an essential component of disease prevention. Setting up a well planned strategic vaccination program means determining what diseases to vaccinate against, identifying who will most benefit from vaccination and finding out when they will most need the protection that vaccines provide. For more details on planning a vaccination program, please contact your herd veterinarian.

Preventing the introduction and spread of infectious diseases

Note: Every animal that dies unexpectedly on your farm should be examined by your herd veterinarian to determine the cause of death.

1. Keeping a closed herd

Keeping a closed herd is one way to protect cattle from infectious disease. In a closed herd, no cattle enter the farm either by purchase or loan and resident cattle do not make contact with any cattle from other farms. A herd is **not** closed if

- Cattle are purchased or boarded;
- Cattle return to the herd after gong to shows, community pastures or performance evaluation centers;
- Cattle use a pasture that shares a fence line with cattle in pasture on a different farm;
- Bulls are purchased, borrowed or loaned; and
- Cattle from the herd are transported by someone else or in someone else's vehicle

2. Purchasing new cattle

It is important to plan the introduction of animals to minimize the risk that an infectious disease will be brought in at the same time. Three factors are important in reducing the risk of infectious diseases when purchasing new cattle.

- The protection you have given your herd by proper vaccination
- The source of purchased cattle, including how they are transported to the farm
- The method you will use to actually introduce the new cattle to the rest of the herd

3. Resident cattle

Make certain your own cattle are properly vaccinated according to the manufacturer's and your herd veterinarian's recommendations before bringing new cattle into the herd.

4. The source of purchased cattle

- Bring in only animals from herds where you know the health status.
- Bring in only animals from herds with a known effective vaccination program. Get specific information about the vaccination history such as when vaccine was used and when it was given. If killed vaccines were used, make sure that a primary series (two doses given a few weeks apart) was given.
- Avoid purchasing animals from unknown sources or that have been mixed with other cattle
- Buy heifers when purchasing a group of cattle. Because they aren't milking, heifers are easier to quarantine.
- Ask for health information about purchased cattle. Ask for the DHIA somatic cell count information on milking cows. Test the bulk tank for contagious mastitis.
- Transport animals in a vehicle that has been cleaned and disinfected before pick up.

5. Introducing new arrivals

- Quarantine new animals for 30 days before allowing contact with animals on-farm.
- Designate your quarantine area. It should be separated from other cattle on your farm. To prevent the spread of respiratory diseases, quarantined cattle should not share the same airspace with resident cattle.
- Quarantined cattle should not share feeders, waterers or equipment with resident cattle.
- Use a medicated foot bath before allowing purchased cattle to enter the herd.
- Prevent the spread of contagious mastitis by milking the new animals last. Sanitize the milking equipment after milking new cattle.
- Check the new animal's temperature every day or at least every other day during the quarantine period. If it develops a fever, have it checked out by your veterinarian.
- Vaccinate cattle while they are in quarantine.
-

6. Test all purchased cattle for infection with

- BVD virus
- Johne's disease
- Mastitis caused by *Staphylococcus aureus, Streptococcus agalactiae* and *Mycoplasma bovis*
- Bovine leukosis (optional)

It can take 1-2 weeks to get test results so collect and submit the samples as soon as the animal arrives.

7. Controlling farm traffic

Infectious diseases can be carried by people and equipment too. If you borrow equipment from other farms, make sure it has been cleaned before using it on your farm. Producers should limit access on the farm to calves and fresh cows since they are most susceptible to infectious disease.

Some steps to reduce the risk of introducing infectious diseases:

- Limit people's access to the barn. This may mean locking the door to the barn.
- Post a warning sign asking visitors to keep out. It helps to provide information on who to contact or a telephone number to call instead of entering the barn.
- Make sure visitors wear clean boots and clothing in the barn. This is important if visitors have already been in other barns. Provide some large size coveralls and boots in the barn for visitors to wear. Disposable plastic boots can be used but they wear out quickly.
- Make sure visitors use a foot bath and clean their boots with a brush and disinfectant **before** entering your barn.
- Have bull calves and other sale animals picked up without allowing the dealer or transporter to enter the barn.
- Have dead animals picked up without allowing the livestock renderer to enter your barn or come in contact with your animals.
- Keep a record of visitors.
- Use your own halters and ropes.

It is difficult to control all traffic on the farm but you can identify the traffic that represents the most risk. These include people who frequently visit other farms and people who have already visited other farms on the day they visit your farm.

Major infectious diseases of cattle in Wisconsin and their primary means of spread

Disease	Major means of spread
Bovine viral diarrhea (BVD)	Direct contact with infected cattle or their body fluids
Contagious mastitis (Staph aureus, Strept. Agalactiae	Contact with infected milk, usually at milking
Mycoplasma bovis	Contact with respiratory carrier or infected milk
Bovine leukosis virus	Contact with blood of infected cattle
IBR, BRSV and PI_3 viruses	Spread through the air
E. coli, rotavirus and coronavirus	Contact with manure from infected cattle
Salmonellosis	Contact with manure from infected cattle
Leptospirosis	Contact with urine from infected carrier cattle
Hairy heel warts	Contact with environment of infected cows
Johne's disease	Contact with manure from infected cattle

3.3. Catastrophic Mortality Management

Refer to NRCS standards, or state guidance, regarding appropriate catastrophic animal mortality handling methods.

Plan for Catastrophic Animal Mortality Handling

The following table describes how you plan to manage catastrophic loss of animals in a manner that protects surface and ground water quality. You must follow all national, state and local laws, regulations and guidelines that protect soil, water, air, plants, animals and human health.

Rendering Services are preferred but may not be available in this area. Composting or burial may be used as alternative methods. Composting: Temporary composting may be allowed under direction of the State Veterinarian's office. A site must be chosen with impermeable surface to prevent leaching into groundwater. Sides of the compost bins may be temporarily made of round bales of silage or stalks. Sufficient composting material must be used. Finished compost must be spread at agronomic rates. Up to 50% of the compost may be mixed back into the composter to be reused as carbon source. (See Tennessee Emergency Disposal of Dead Animals in this section.)

Important! In the event of catastrophic animal mortality, contact the following authority before beginning carcass disposal:

Authority name: State Veterinarian of Tennessee
Contact name: Dr Charles Hatcher
Phone number: 615 837-5120

3.4. Fuels & Chemical Handling

Gasoline and diesel fuel is stored on site in above-ground storage tanks located northwest of the dairy barn. These tanks are inspected frequently. No leaks were observed. Detergents and disinfectants are stored in the tank room south of the dairy barn to be used for power washing and cleanup of the milking equipment. Roundup herbicide and other weed control chemicals are stored in the machine shed and used for maintaining fence lines and pastures as needed.

No other hazardous chemicals are stored at this location.

Fuel handling:

Small spills during fuel transfer are bound to occur from time to time. Petroleum fuel evaporates rapidly at the land surface; however fuel readily seeps into the soil. Local geology and soil type determines how quickly fuel may reach groundwater supplies. Once in the groundwater environment, fuel is relatively stable, making it difficult to clean up. Even small spills or leaks in the same place over time are a potential threat to water resources. To reduce potential leaks and spills during fuel transfer:

- Always supervise fuel transfer from storage to equipment to prevent spillover.
- Use a can to catch any drops that may follow after shutting off the fuel nozzle.
- Replace a leaking or defective nozzle promptly.
- Enforce a "no smoking" rule at the fuel handling and storage facility.
- Keep fuel pumps and nozzles secure from children or vandalism.
- Label each pump or nozzle as to the type of fuel dispensed.

Above-ground Storage Tanks (ASTs) provide easy access and greater opportunity to observe and monitor tanks that may be leaking as compared to underground tanks. However, placement of tanks above the ground requires that tanks be protected from impact by farm equipment and personal vehicles. Spending some time on the proper placement of a new tank or implementing safety procedures to an existing tank can greatly reduce any risks associated with an AST.

Following are specific points that should be addressed when conducting an assessment of your ASTs.

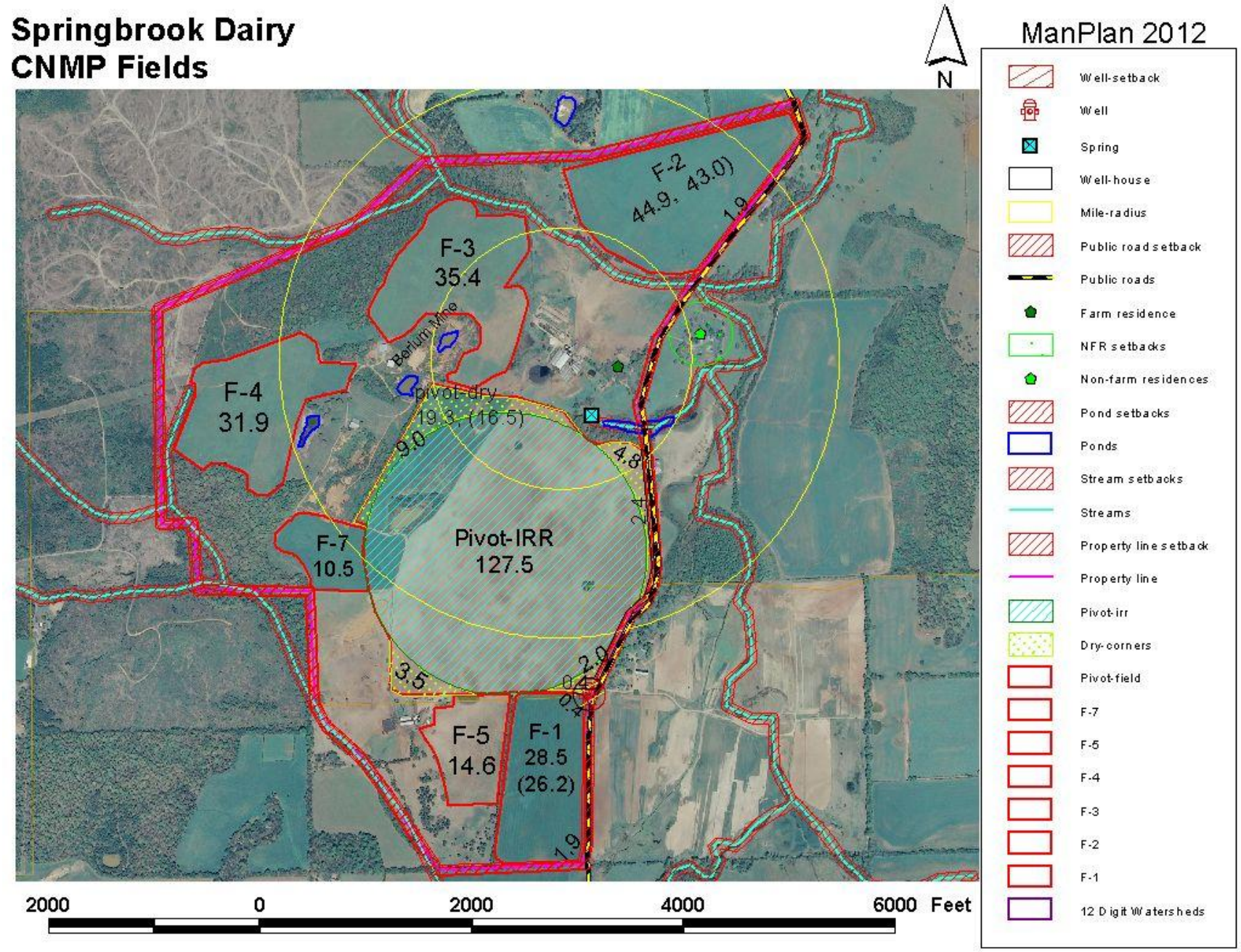
- Comply with state-local rules for electrical safety and fire prevention. Keep a fire extinguisher in close proximity (e.g. within 75 feet) of ASTs.
- AST’s should be located at least 50 feet from any building or combustible storage.
- Properly label tank contents, describe the health and physical hazards of the product.
- Secure against vandalism and tampering.
- If top-opening only, place on a stable base of timbers, blocks, concrete, etc. ASTs should not be in contact with bare soil.
- Display a "No Smoking" sign.
- Guard tank against impact. Choose a site where farm vehicles can easily maneuver for fueling.
- Enclose wiring in a conduit.
- Locate ASTs where soil strength is adequate to hold the weight of a full storage tank (or tanks).

CHEMICALS: *For hazardous chemicals that may be stored on this site in the future, the following guidelines should be implemented.*

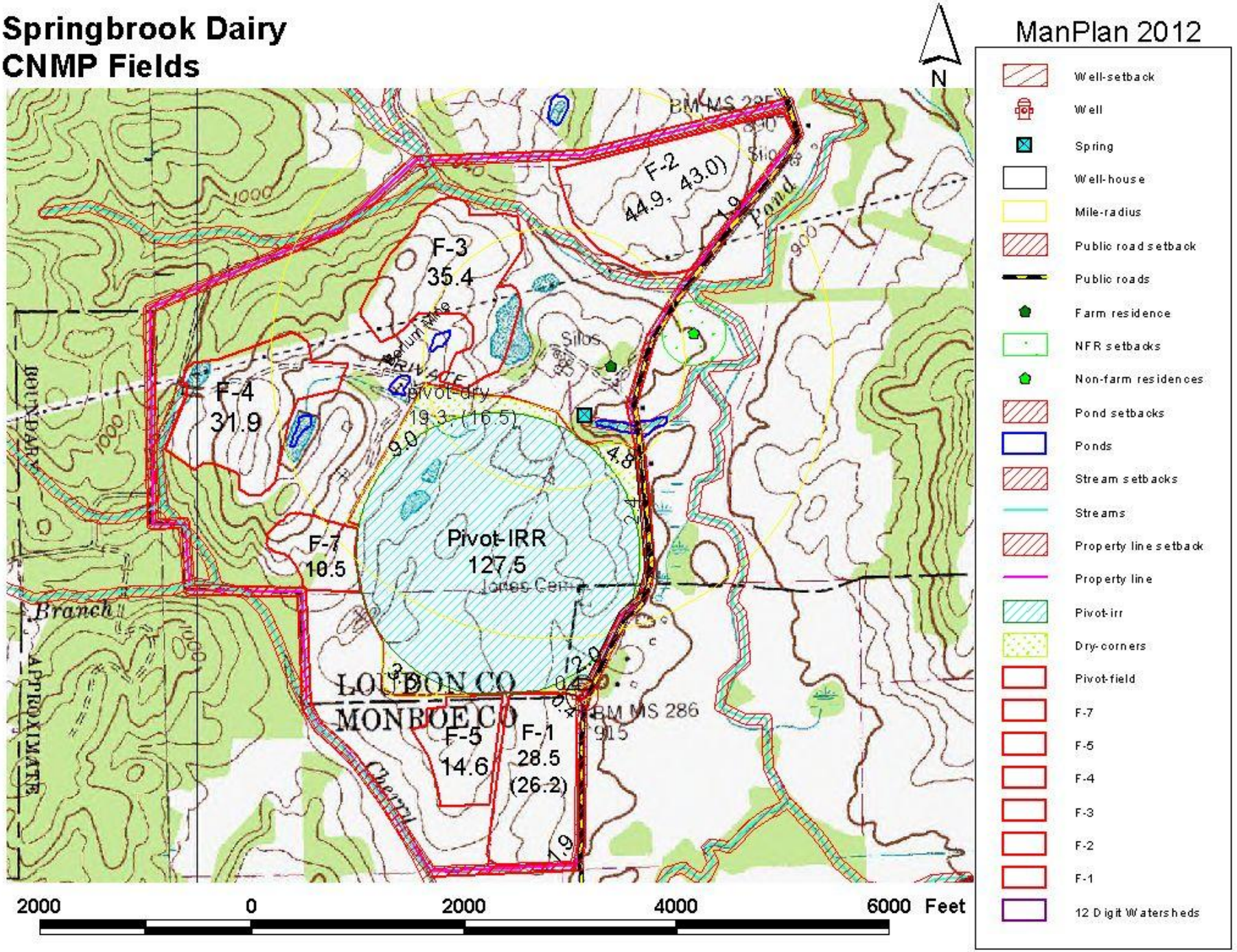
	Measure
X	All chemicals are stored in proper containers. Expired chemicals and empty containers are properly disposed of in accordance with state and federal regulations. Pesticides and associated refuse are disposed of in accordance with the FIFRA label.
X	Chemical storage areas are self-contained with no drains or other pathways that will allow spilled chemicals to exit the storage area.
X	Chemical storage areas are covered to prevent chemical contact with rain or snow.
X	Emergency procedures and equipment are in place to contain and clean up chemical spills.
X	Chemical handling and equipment wash areas are designed and constructed to prevent contamination of surface waters and waste water and storm water storage and treatment systems.

Section 4. Land Treatment

4.1. Map(s) of Fields and Conservation Practices



Springbrook Dairy
CNMP Fields



4.2. Land Treatment Conservation Practices

This section has individual field information for all fields in the nutrient management plan, including: Aerial photos and topographical maps, marked with setbacks and conservation practices implemented, soil tests results and RUSLE-2 individual field profiles.

Information for each field:

- **FSA map**
- **Overview Map, (with conservation practices)**
- **Soil type maps**
- **Topography maps**
- **RUSLE2 Individual Field Profile Report**
- **Soil Test results**

Necessary conservation practices have been established and maintained on crop field and pastures where animal by-products are applied. All fields have vegetative buffers established next to intermittent streams or ponds. Refer to the conservation plan for any additional practices that may be implemented on this farm.

The following NRCS Standard Practices apply to this CNMP and are included in Section 10 for reference.

313 - Waste Storage Facility
634 - Waste Transfer
511 - Forage Harvest Management
528 - Prescribed Grazing
590 - Nutrient Management
633 - Waste Utilization
634 - Waste Irrigation

Planned Land Treatment:

This section of the plan addresses management practices for all fields to reduce soil losses to or below tolerable soil losses or “T” values. Topography, soil types, slopes and lengths of slopes, crop yields, and crop management practices were taken into consideration as well as conservation practices and land treatment operations. RUSLE2 soil loss calculations were completed for all fields in this plan and field inspections were carried out in the spring of 2012.

All fields are below “T” levels with the current system of land treatment, crops, irrigation management and seeding practices.

Soil types present in the fields included in this Nutrient Management Plan are:

Louden County

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Foundation Limits	Non-Irr Class
DcC2	Decatur silty clay loam, eroded sloping phase	88.4	30.3%	> 6.5ft.	> 6.5ft.	somewhat limited	IVe
DcC3	Decatur silty clay loam, severely eroded sloping phase	25	8.6%	> 6.5ft.	> 6.5ft.	somewhat limited	IVe
DdC3	Decatur silty clay loam, 5 to 12 percent slopes, severely eroded	24.9	8.6%	> 6.5ft.	> 6.5ft.	somewhat limited	IVe
DcB	Decatur silt loam, 2 to 5 percent slopes	23.7	8.1%	> 6.5ft.	> 6.5ft.	somewhat limited	IIe
DwD3	Dewey silty clay, severely eroded moderately steep phase	21	7.2%	> 6.5ft.	> 6.5ft.	very limited	VIe
FcC	Fullerton cherty silt loam, sloping phase	17.7	6.1%	> 6.5ft.	> 6.5ft.	somewhat limited	IIIe
Em	Emory silt loam	16.6	5.7%	5.5ft.	> 6.5ft.	very limited	I
DeC2	Dewey silty clay loam, eroded sloping phase	14.4	4.9%	> 6.5ft.	> 6.5ft.	somewhat limited	IIIe
FsD	Fullerton silt loam, moderately steep phase (dewey)	12.4	4.2%	> 6.5ft.	> 6.5ft.	very limited	IVe
DcB2	Decatur silty clay loam, eroded gently sloping phase	11.8	4.1%	> 6.5ft.	> 6.5ft.	somewhat limited	IIIe
DeD2	Dewey silty clay loam, eroded moderately steep phase	7.9	2.7%	> 6.5ft.	> 6.5ft.	very limited	IVe
FcD	Fullerton cherty silt loam, moderately steep phase	6.5	2.2%	> 6.5ft.	> 6.5ft.	very limited	IVe
DcD2	Decatur silty clay loam, eroded moderately steep phase	6.2	2.1%	> 6.5ft.	> 6.5ft.	very limited	VIe
HeC2	Hermitage silt loam, eroded sloping phase (etowah)	5.1	1.7%	> 6.5ft.	> 6.5ft.	somewhat limited	IIIe
DgC3	Dewey silty clay loam, 5 to 12 percent slopes, severely eroded	4.2	1.5%	> 6.5ft.	> 6.5ft.	somewhat limited	IVe
EtB	Etowah silt loam, gently sloping phase	1.5	0.5%	> 6.5ft.	> 6.5ft.	not limited	IIe
LdB	Landisburg silt loam, gently sloping phase (tasso)	1.2	0.4%	> 6.5ft.	> 6.5ft.	not limited	IIe
EtC2	Etowah silt loam, eroded sloping phase	0.9	0.3%	> 6.5ft.	> 6.5ft.	somewhat limited	IIIe
DwE3	Dewey silty clay, severely eroded steep phase	0.7	0.2%	> 6.5ft.	> 6.5ft.	very limited	VIe

Monroe County

EtC	Etowah silt loam, 5 to 12 percent slopes	0.5	0.2%	> 6.5ft.	> 6.5ft.	somewhat limited	IIIe
Lo	Lindside silt loam, local alluvium phase	0.3	0.1%	2.2ft.	> 6.5ft.	very limited	IIw
Ma	Made land	0.2	0.1%	> 6.5ft.	> 6.5ft.	not rated	VIIIs
EtB	Etowah silt loam, 2 to 5 percent slopes	0.2	0.1%	> 6.5ft.	> 6.5ft.	not limited	IIe
DwC3	Dewey silty clay, severely eroded sloping phase	0.1	0.0%	> 6.5ft.	> 6.5ft.	somewhat limited	IVe
Ro	Rockland	0.1	0.0%	> 6.5ft.	> 6.5ft.	not rated	VIIs

Include Soil Map Unit Descriptions next page.

Section 5. Soil and Risk Assessment Analysis

5.1. Soil Information

Field	Soil Survey	Map Unit	Soil Component Name	Surface Texture	Slope Range (%)	OM Range (%)	Soil 'T' (Tolerable Soil Loss)
Pivot-Irr	105	DcC2	Decatur	SICL	5-12%	0.5-2%	5
Dry-corners	105	DcC2	Decatur	SICL	5-12%	0.5-2%	5
F-1	123	DdC3	Decatur	SICL	5-12%	0.5-2%	5
F-2	105	DcC2	Decatur	SICL	5-12%	0.5-2%	5
F-3	105	DwD3	Dewey	SIC	12-20%	0.5-1%	5
F-4	105	FsD	Dewey	SIL	12-20%	1-3%	5
F-5	123	DdC3	Decatur	SICL	5-12%	0.5-2%	5
F-7	105	DeC2	Dewey	SICL	5-12%	0.5-2%	5

5.2. Predicted Soil Erosion

Field	Predominant Soil Type	Slope (%)	Conserva-tion Plan Soil Loss (Ton/A/Yr)	Gully (Ton/A/Yr)	Ephemeral (Ton/A/Yr)	T Factor (Ton/A/Yr)
Pivot-Irr	DcC2 (Decatur SICL)	4.0	1.5			5
Dry-corners	DcC2 (Decatur SICL)	3.0	3.6			5
F-1	DdC3 (Decatur SICL)	5.0	1.8			5
F-2	DcC2 (Decatur SICL)	5.0	1.9			5
F-3	DwD3 (Dewey SIC)	12.0	1.2			5
F-4	FsD (Dewey SIL)	12.0	1.2			5
F-5	DdC3 (Decatur SICL)	5.0	1.8			5
F-7	DeC2 (Dewey SICL)	5.0	1.9			5

5.3. Nitrogen and Phosphorus Risk Analysis

Tennessee Phosphorus Index

The Tennessee Phosphorus (P) index was used to determine the potential for phosphorus transport off the fields. Considering all of the parameters that go into calculating the Phosphorus Index, Table 9 (next page), summarizes the P-Index for each field. Planned manure applications will not have a significant impact on the P-Index in the fields in this NMP unless exceeding the maximum rates listed on Table 9. All fields have P-Indexes rated MEDIUM to LOW at the indicated application rates for P2O5.

While soil test P is not the only factor affecting Phosphorus environmental risks, this plan does consider that soil P levels are very high for several of the application fields. The plan recommends that P2O5 applications for Field '4-ac' be discontinued so that P concentration in the soil will be reduced over time. Also for all other fields P2O5 applications should be limited to removal rates so that soil P values do not continue to increase for fields that are in the high to very high range for Phosphorus.

Environmental Considerations for Managing Phosphorus:

Phosphorus (P) loading to surface water can accelerate Eutrophication. The availability of other nutrients and light penetration into the water column will also influence the response of water bodies to phosphorus. Factors such as: the amount of erosion and runoff, the form, amount, and distribution of phosphorus in the soil: and fertilizer and manure application rate, timing and placement determine P loss from agricultural fields and the resulting P loading to water resources. Most phosphorus compounds found in soils have low water solubility. Consequently, P loss from agricultural land was once thought to be primarily associated with soil erosion. In many cases, sediment-bound P is still the dominant form in which P losses from agricultural fields occur. Over the past decade, research has shown that phosphorus can be lost in runoff in dissolved forms. High dissolved P concentration in runoff is more frequently observed where soil P levels are high particularly near the soil surface. High soil P levels, however, do not automatically equate to high dissolved P in runoff. As stated earlier, numerous factors interact to create the potential for P losses from agricultural fields. Many of the basis processes that govern P transport are known.

The Tennessee P Index rates the application fields based on the following factors:

- Soil Test P
- P2O5 application rate (all sources)
- Form of Phosphorus applied
- Timing of Phosphorus applications
- Method of application
- Hydrological group rating of the soils in the application field.
- Buffer and Setback widths, slopes % and length, vegetative cover, and soil texture

According to the NRCS nutrient management standard, fields ranked in the MEDIUM risk category may receive organic (manure) or inorganic (commercial fertilizer) applications at nitrogen-based rates per the table below.

Total Points from P Index	*neralized Interpretation of P Index Points for the Site*
< 100	**LOW** potential for P movement from the field. If farming practices are maintained at the current level there is a low probability of an adverse impact to surface waters from P losses. Nitrogen-based nutrient management planning is satisfactory for this site. Soil P levels and P loss potential may increase in the future due to N-based nutrient management.
100 - 200	**MEDIUM** potential for P movement from the field. The chance for adverse impact to surface waters exists. *Nitrogen-based nutrient management planning may be satisfactory for this field when conservation measures are implemented to lessen the probability of P loss*. Soil P levels and P loss potential may increase in the future due to N-based nutrient management.
201 - 300	**HIGH** potential for P movement from the field. The chance for adverse impact to surface waters is likely unless remedial action is taken. Soil and water conservation practices are necessary (if practical) to reduce the risk of P movement and water quality degradation. If risk cannot be reduced, then a P-based nutrient management plan will be implemented.
> 301	**VERY HIGH** potential for P movement from the field and an adverse impact on surface waters. All necessary soil and water conservation practices, plus a P-based nutrient management plan must be put in place to avoid the potential for water quality degradation.

Tennessee Phosphorus Index

Field	Crop Year	Site and Transport Factor	Mgmt. and Source Factor	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Pivot-Irr	2012	6	18	24	108	Medium
Pivot-Irr	2013	6	18	24	108	Medium
Pivot-Irr	2014	6	18	24	108	Medium
Pivot-Irr	2015	6	18	24	108	Medium
Pivot-Irr	2016	6	18	24	108	Medium
Dry-corners	2012	6	4	24	24	Low
Dry-corners	2013	6	4	24	24	Low
Dry-corners	2014	6	4	24	24	Low
Dry-corners	2015	6	4	24	24	Low
Dry-corners	2016	6	4	24	24	Low
F-1	2012	12	4	48	48	Low
F-1	2013	12	4	48	48	Low
F-1	2014	12	4	48	48	Low
F-1	2015	12	4	48	48	Low
F-1	2016	12	4	48	48	Low

Field	Crop Year	Site and Transport Factor	Mgmt. and Source Factor	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
F-2	2012	12	4	48	48	Low
F-2	2013	12	4	48	48	Low
F-2	2014	12	4	48	48	Low
F-2	2015	12	4	48	48	Low
F-2	2016	12	4	48	48	Low
F-3	2012	12	8	96	96	Low
F-3	2013	12	8	96	96	Low
F-3	2014	12	8	96	96	Low
F-3	2015	12	8	96	96	Low
F-3	2016	12	8	96	96	Low
F-4	2012	12	4	48	48	Low
F-4	2013	12	4	48	48	Low
F-4	2014	12	4	48	48	Low
F-4	2015	12	4	48	48	Low
F-4	2016	12	4	48	48	Low
F-5	2012	12	4	48	48	Low
F-5	2013	12	4	48	48	Low
F-5	2014	12	4	48	48	Low
F-5	2015	12	4	48	48	Low
F-5	2016	12	4	48	48	Low
F-7	2012	12	4	48	48	Low
F-7	2013	12	4	48	48	Low
F-7	2014	12	4	48	48	Low
F-7	2015	12	4	48	48	Low
F-7	2016	12	4	48	48	Low

5.4. Additional Field Data Required by Risk Assessment Procedure

Field	Distance to Water (Feet)	Slope Length (Feet)	Buffer Width (Feet)	Tillage/Cover Type
Pivot-Irr	1,650	100	40	No-till w/ light to medium residues
Dry-corners	200	100	40	No-till w/ light to medium residues
F-1	1,550	200	40	No-till w/ light to medium residues
F-2	825	200	40	No-till w/ light to medium residues
F-3	675	100	40	No-till w/ light to medium residues
F-4	775	100	40	No-till w/ light to medium residues
F-5	750	200	40	No-till w/ light to medium residues
F-7	400	200	40	No-till w/ light to medium residues

Nitrogen Leaching Risk Assessment and Nitrogen Management:

Nitrogen Leaching potential was assessed for all the fields in this CNMP using the nationally accepted "Colorado Nitrogen Leaching Index Risk Assessment" tool.
The results are listed in a table on the following page. All of the fields have LOW ratings under the planned management for crops grown and nitrogen sources applied.

Permeability Class, irrigation methods and efficiencies, Manure effluent application rates, application timing and mitigating practices implemented were factors considered to make this determination.

The following practices are additional recommendations as part of an overall nutrient management plan to reduce nitrogen losses to groundwater by leaching.

1. Set realistic yield goals and consider University of Tennessee nitrogen recommendations for crops grown.
2. Properly sample lagoon effluent applied to determine actual Nitrogen and other plant nutrients being applied.
3. Apply nitrogen in split applications during the growing season to reduce leaching losses and improve plant utilization of nitrogen by supplying N nearer to the times when the plants need the most nitrogen, at green up in the spring and after silage harvests throughout the summer.
4. Take credit for nitrogen from **all** sources: previously grown legume crops, nitrogen contained in any fertilizer products applied, manure applications, etc.
5. Conduct a post-harvest evaluation of the nitrogen program:
    - Compare actual yields vs. yield goal;
    - Evaluate factors affecting yields and nitrogen use efficiency;
    - Consider using plant tissue sampling and nitrate tests to evaluate plant nitrogen sufficiency;
    - Refine nitrogen rates for future years.
6. Consider taking some deep soil tests in the spring to determine nitrogen availability & movement in the soil.
7. Review each nutrient management plan annually to determine if changes in the nutrient budget are needed.
8. Calibrate application equipment annually, at minimum, to ensure uniform distribution of material at planned rates.
9. Avoid applying nitrogen around environmentally sensitive areas such as sinkholes, wells, gullies, ditches, surface inlets, or rapidly permeable areas.
10. Observe all manure and effluent application setbacks and/of buffers for irrigation and other manures or compost applications.

NRCS National - Nitrogen Leaching Tool

Nitrogen Leaching Index Risk Assessment (Version 2.0)					
Factor	Low (1)	Medium (2)	High (3)	Very High (4)	Score
1.Permeability Class	Very slow, slow, and mod slow	Moderate	Moderately rapid	Rapid and very rapid	**2**
2. Irrigation Application Efficiency	High >85%	Moderate 60-85%	Moderately Low 35 – 60%	Low , 35%	**1**
3a. Nitrogen Application Rate (commercial N fertilizer with or without manure)	Total N application below agronomic rate	Total N application rate equal to agronomic rate	Total N application rate is 1 to 50 lbs/acre above agronomic rate	Total N application rate is > 50 lbs/acre above agronomic rate	**1**
3b. Manure Effluent Application Rate (no commercial N fertilizer)	Applied at P agronomic rate	Applied at N agronomic rate	Applied above N agronomic rate	Applied above N agronomic rate more than one consecutive year.	**2**
4. Application Timing	In season split application (2 or more splits)	Any nitrogen application 0-3 months before crop planting	Any nitrogen application 3-5 months before crop planting	Any nitrogen application more than 5 months before crop planting	**1**
GROSS SCORE (Sum of 1 thru 4)					**7**
5. Best Management Practice (BMP) Implementation Credits: Subtract 1 point for each of the following BMP's implemented in the field: <*Slow Release Fertilizers*>; **<*Cover Crops*>;** <*Nitrification Inhibitors**>**;<*Deep Rooted Crops in Rotation*>**; <*Deep Soil Sampling to determine sub-soil N credit*>;					**2**
Net Score; (Sum of factors 1 thru 4 minus factor 5, BMP credits)					**5**

Net Score	Risk Interpretations
< 8	This field has a **LOW** risk for nitrogen leaching if management is maintained at the current level. If there is an underlying aquifer that is shallow (< 20 ft) or used locally as a public drinking water source, increase the risk to **MEDIUM**.
8 to 11	This field has a **MEDIUM** risk for nitrogen leaching and some management changes may be needed to decrease risk. Apply nitrogen at agronomic rates or lower using spring or split in-season applications. If there is an underlying aquifer that is shallow (< 20 ft) or used locally as a public drinking water source, increase the risk to **HIGH.**
12 to 15	This field has a **High**-risk for nitrogen leaching and management changes should be implemented to decrease risk. Manure should be applied at P agronomic rates. Apply nitrogen using split in-season applications at or below the agronomic rate. Changes in irrigation management and/or method may also be necessary. If there is an underlying aquifer that is shallow (< 20 ft) or used locally as a public drinking water source, increase the risk to **VERY HIGH**.
16	This field has a **VERY High**-risk for nitrogen leaching and management changes are needed to decrease risk. **Manure applications are NOT recommended**. Apply nitrogen using split in-season applications at or below the agronomic rate. Changes in irrigation management and/or method are necessary to protect ground water. Implement all appropriate BMPs.

Section 6. Nutrient Management

6.1. Field Information

Field ID	Total Acres	Spreadable Acres	County	Predominant Soil Type	Slope (%)	FSA Farm	FSA Tract	FSA Field
Pivot-Irrigated	127.5	127.5	Loudon	DcC2 (Decatur SICL)	4.0			
Dry-corners	19.3	16.5	Loudon	DcC2 (Decatur SICL)	3.0			
F-1	28.5	26.2	Monroe	DdC3 (Decatur SICL)	5.0			
F-2	44.9	43.0	Loudon	DcC2 (Decatur SICL)	5.0			
F-3	35.4	35.4	Loudon	DwD3 (Dewey SIC)	12.0			
F-4	31.9	31.9	Loudon	FsD (Dewey SIL)	12.0			
F-5	14.6	14.6	Monroe	DdC3 (Decatur SICL)	5.0			
F-7	10.5	10.5	Loudon	DeC2 (Dewey SICL)	5.0			
Total	**312.6**	**305.6**						

OVERVIEW:

This Nutrient Management Plan conforms to the Tennessee NRCS 590 Standard Practice

P1, Phosphorus:

Soil Sample results indicated that most fields are in the High to Very High range for soil P. Liquid manure applications are planned for slightly less than P rate so that over time the soil P levels are expected to decrease for the fields Very High in Phosphorous. Also See table 6-12 “Projected P & K levels”, page 78.

Over time the manure applications recommended are expected to also decrease the P risk slightly. If liquid manure is injected or incorporated this will decrease the P risk factors even more. The Phosphorus Index, a measure of risk of phosphorus pollution, is currently rated Medium for the center pivot field with liquid manure applications planned. All other fields are rated ‘Low’ per the Tennessee Phosphorous Index. (pages 53-54)

Manure and fertilizers are recommended according to UT recommendations in Table 6.7 ‘Planned Nutrient Applications’. (pages 66-67).

K, Potassium:
Soil Sample results indicated that all Pastures range from Very Low to Optimum for soil Potassium (K) levels. Over time the manure applications recommended are expected to maintain or build soil K levels. Silage removes more potassium from the soil than grain and manure applications are a good way to add potassium back to the soil. Potash fertilizers (0-0-60) are recommended at 100 to 300 lbs/acre of potash (0-0-60) to provide build-up and maintenance fertilizers per soil test results and planned crops. Manure and fertilizers are recommended according to UT recommendations in Table 6.7 'Planned Nutrient Applications'. (pages 66-67). Also See table 6-12 "Projected P & K levels", page 78.

pH:
For maximum yields and soil fertility, it is recommended to maintain a soil pH of at least 6.0 for corn & small grains rotations. If pH is less than 6.0, liming material should be applied at U T recommended rates based on the CCE (Calcium Carbonate Equivalent) rating and the fineness of the limestone material. If alfalfa or clover is part of the rotation pH should be maintained between 6.5 and 7.0.

Field 2 is recommended to have 1-2 tons of lime per acre per Lime tables in section 10.
All other fields are currently are within the optimal range for planned crop rotations.
All fields receiving lime applications should be retested at least 6 months after lime is applied to re-evaluate pH.

Recommendations:

Field by field manure and fertilizers are recommended according to UT recommendations in Table 6.7 'Planned Nutrient Applications'. (pages 66-67).

Guidance in developing a nutrient budget may be obtained from your NRCS Field Office or your University of Tennessee Agricultural Extension Service Agent.
Land application procedures must be planned and implemented in a way that minimizes potential adverse impacts to the environment and public health.

6.2. Manure Application Setback Distances

Setback Requirements: Class II CAFO

Feature	Setback Criteria	Setback Distance (Feet)
Streams	Applied upgradient, permanent vegetated setback >=35 feet	35
Streams	New operation, near high quality stream	60
Surface waters	Applied upgradient, permanent vegetated setback >=35 feet	35
Open tile line inlet structures	Applied upgradient, permanent vegetated setback >=35 feet	35
Sinkholes	Applied upgradient, permanent vegetated setback >=35 feet	35
Agricultural well heads	Applied upgradient, permanent vegetated setback >=35 feet	35
Other conduits to surface waters	Applied upgradient, permanent vegetated setback >=35 feet	35
Potable well, public or private	Application upgradient of feature	300
Potable well, public or private	Application down-gradient of feature	150

Source: TN DEQ Rule 1200-4-5-.14(17)(d) (http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-05.pdf)

Setback Requirements: NRCS Standard

Feature	Setback Criteria	Setback Distance (Feet)
Well	Application upgradient of feature	300
Well	Application down-gradient of feature	150
Waterbody	Predominant slope <5% with good vegetation	30
Waterbody	Predominant slope 5 to 8% with good vegetation	50
Waterbody	Predominant slope >8%	100
Waterbody	Poor vegetation	100
Public road	All applications	50
Dwelling (other than producer)	All applications	300
Public use area	All applications	300
Property line	Application upgradient of feature	30

Source: Nutrient Management Standard 590
(http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc)

6.3. Soil Test Data

Field	Test Year	OM (%)	P Test Used	P	K	Mg	Ca	Units	Soil pH	Buffer pH	CEC (meq/ 100g)
Pivot-Irr	2012	4.4	Mehlich-3 ICP	89	241	485	2,263	lbs/a	6.5	7.7	10.3
Dry-corners	2012	4.4	Mehlich-3 ICP	89	241	485	2,263	ppm	6.5	7.7	10.3
F-1	2012	2.3	Mehlich-3 ICP	100	92	315	1,362	lbs/a	6.5	7.8	6.2
F-2	2012	4.5	Mehlich-3 ICP	93	312	424	2,270	lbs/a	6.1	7.6	11.2
F-3	2012	4.6	Mehlich-3 ICP	334	347	347	3,758	lbs/a	6.7	7.8	12.3
F-4	2012	3.9	Mehlich-3 ICP	236	179	193	2,607	lbs/a	6.7	7.8	8.4
F-5	2012	3.6	Mehlich-3 ICP	190	146	222	4,410	lbs/a	7.6	7.9	12.1
F-7	2012	3.7	Mehlich-3 ICP	187	207	417	2,341	lbs/a	6.4	7.7	9.9

6.4. Manure Nutrient Analysis

Manure Source	Dry Matter (%)	Total N	NH_4-N	Total P_2O_5	Total K_2O	Avail. P_2O_5	Avail. K_2O	Units	Analysis Source and Date
Holding Pond 1	0.8	4.1	3.0	1.8	4.5	1.8	4.5	Lb/1000Gal	Dairy Tech Labs 2/03/2012
Parlor Pond	0.8	4.1	3.0	1.8	4.5	1.8	4.5	Lb/1000Gal	Dairy Tech Labs 2/03/2012

(1) Entered analysis may be the average of several individual analyses.
(2) Tennessee assumes that 100% of manure phosphorus and 100% of manure potassium is crop available. First-year per-acre nitrogen availability for individual manure applications is given in the Planned Nutrient Applications table. For more information about nitrogen availability in Tennessee, see "Manure Application Management," Tables 3 and 4, Tennessee Extension, PB1510, 2/94 (http://wastemgmt.ag.utk.edu/ExtensionProjects/extension_publications.htm).

6.5. Planned Crops and Fertilizer Recommendations

Field	Crop Year	Planned Crop	Yield Goal (per Acre)	N Rec (Lbs/A)	P_2O_5 Rec (Lbs/A)	K_2O Rec (Lbs/A)	N Removed (Lbs/A)	P_2O_5 Removed (Lbs/A)	K_2O Removed (Lbs/A)	Custom Fert. Rec. Source
Pivot-Irr	2012	Other*	7.0							3 crops per year planned
Pivot-Irr	2012	Corn silage	22.0 Ton	250[a]	0	320[a]	183	79	183	irrigated: sm grain silage; corn silage; soybeans
Pivot-Irr	2013	Other*	7.0							3 crops per year planned
Pivot-Irr	2013	Corn silage	22.0 Ton	250[a]	0	320[a]	183	79	183	irrigated: sm grain silage; corn silage; soybeans
Pivot-Irr	2014	Other*	7.0							3 crops per year planned
Pivot-Irr	2014	Corn silage	22.0 Ton	250[a]	0	320[a]	183	79	183	irrigated: sm grain silage; corn silage; soybeans
Pivot-Irr	2015	Other*	7.0							3 crops per year planned
Pivot-Irr	2015	Corn silage	22.0 Ton	250[a]	0	320[a]	183	79	183	irrigated: sm grain silage; corn silage; soybeans
Pivot-Irr	2016	Other*	7.0							3 crops per year planned
Pivot-Irr	2016	Corn silage	22.0 Ton	250[a]	0	320[a]	183	79	183	irrigated: sm grain silage; corn silage; soybeans
Dry-corners	2012	Other*	4.0							
Dry-corners	2012	Corn silage	20.0 Ton	150	0	0	166	72	166	
Dry-corners	2013	Other*	4.0							
Dry-corners	2013	Corn silage	20.0 Ton	150	0	0	166	72	166	
Dry-corners	2014	Other*	4.0							
Dry-corners	2014	Corn silage	20.0 Ton	150	0	0	166	72	166	
Dry-corners	2015	Other*	4.0							
Dry-corners	2015	Corn silage	20.0 Ton	150	0	0	166	72	166	
Dry-corners	2016	Other*	4.0							
Dry-corners	2016	Corn silage	20.0 Ton	150	0	0	166	72	166	
F-1	2012	Corn grain	160.0 Bu	160	0	140	120	70	46	
F-1	2013	Soybean	50.0 Bu	0	0	80	200	40	70	
F-1	2014	Corn grain	160.0 Bu	160	0	140	120	70	46	
F-1	2015	Soybean	50.0 Bu	0	0	80	200	40	70	
F-1	2016	Corn grain	160.0 Bu	160	0	140	120	70	46	
F-2	2012	Corn grain	160.0 Bu	160	0	0	120	70	46	
F-2	2013	Soybean	50.0 Bu	0	0	0	200	40	70	
F-2	2014	Corn grain	160.0 Bu	160	0	0	120	70	46	
F-2	2015	Soybean	50.0 Bu	0	0	0	200	40	70	
F-2	2016	Corn grain	160.0 Bu	160	0	0	120	70	46	

Field	Crop Year	Planned Crop	Yield Goal (per Acre)	N Rec (Lbs/A)	P_2O_5 Rec (Lbs/A)	K_2O Rec (Lbs/A)	N Removed (Lbs/A)	P_2O_5 Removed (Lbs/A)	K_2O Removed (Lbs/A)	Custom Fert. Rec. Source
F-3	2012	Corn grain	160.0 Bu	160	0	0	120	70	46	
F-3	2013	Soybean	50.0 Bu	0	0	0	200	40	70	
F-3	2014	Corn grain	160.0 Bu	160	0	0	120	70	46	
F-3	2015	Soybean	50.0 Bu	0	0	0	200	40	70	
F-3	2016	Corn grain	160.0 Bu	160	0	0	120	70	46	
F-4	2012	Corn grain	160.0 Bu	160	0	70	120	70	46	
F-4	2013	Soybean	50.0 Bu	0	0	40	200	40	70	
F-4	2014	Corn grain	160.0 Bu	160	0	70	120	70	46	
F-4	2015	Soybean	50.0 Bu	0	0	40	200	40	70	
F-4	2016	Corn grain	160.0 Bu	160	0	70	120	70	46	
F-5	2012	Corn grain	160.0 Bu	160	0	70	120	70	46	
F-5	2013	Soybean	50.0 Bu	0	0	40	200	40	70	
F-5	2014	Corn grain	160.0 Bu	160	0	70	120	70	46	
F-5	2015	Soybean	50.0 Bu	0	0	40	200	40	70	
F-5	2016	Corn grain	160.0 Bu	160	0	70	120	70	46	
F-7	2012	Corn grain	160.0 Bu	160	0	0	120	70	46	
F-7	2013	Soybean	50.0 Bu	0	0	0	200	40	70	
F-7	2014	Corn grain	160.0 Bu	160	0	0	120	70	46	
F-7	2015	Soybean	50.0 Bu	0	0	0	200	40	70	
F-7	2016	Corn grain	160.0 Bu	160	0	0	120	70	46	

* Unharvested cover crop or first crop in double-crop system.
[a] Custom fertilizer recommendation.

6.6. Manure Application Planning Calendar – January 2012 through December 2012

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2012 Crop (Prev. Primary Crop)	Jan '12	Feb '12	Mar '12	Apr '12	May '12	Jun '12	Jul '12	Aug '12	Sep '12	Oct '12	Nov '12	Dec '12
Pivot-Irr	127.5	127.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)				X			X					
Dry-corners	19.3	16.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)												
F-1	28.5	26.2	Decatur SICL (DdC3 5-12%)	Corn grain (Soybean)												
F-2	44.9	43.0	Decatur SICL (DcC2 5-12%)	Corn grain (Soybean)												
F-3	35.4	35.4	Dewey SIC (DwD3 12-20%)	Corn grain (Soybean)												
F-4	31.9	31.9	Dewey SIL (FsD 12-20%)	Corn grain (Soybean)												
F-5	14.6	14.6	Decatur SICL (DdC3 5-12%)	Corn grain (Soybean)												
F-7	10.5	10.5	Dewey SICL (DeC2 5-12%)	Corn grain (Soybean)												
Total	*312.6*	*305.6*						*X*			*X*					

Manure Application Planning Calendar – January 2013 through December 2013

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2013 Crop (Prev. Primary Crop)	Jan '13	Feb '13	Mar '13	Apr '13	May '13	Jun '13	Jul '13	Aug '13	Sep '13	Oct '13	Nov '13	Dec '13
Pivot-Irr	127.5	127.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)				X			X					
Dry-corners	19.3	16.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)												
F-1	28.5	26.2	Decatur SICL (DdC3 5-12%)	Soybean (Corn grain)												
F-2	44.9	43.0	Decatur SICL (DcC2 5-12%)	Soybean (Corn grain)												
F-3	35.4	35.4	Dewey SIC (DwD3 12-20%)	Soybean (Corn grain)												
F-4	31.9	31.9	Dewey SIL (FsD 12-20%)	Soybean (Corn grain)												
F-5	14.6	14.6	Decatur SICL (DdC3 5-12%)	Soybean (Corn grain)												
F-7	10.5	10.5	Dewey SICL (DeC2 5-12%)	Soybean (Corn grain)												
Total	*312.6*	*305.6*						*X*			*X*					

Crop in field	No. indicates total loads "X" indicates other manure apps

Manure Application Planning Calendar – January 2014 through December 2014

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2014 Crop (Prev. Primary Crop)	Jan '14	Feb '14	Mar '14	Apr '14	May '14	Jun '14	Jul '14	Aug '14	Sep '14	Oct '14	Nov '14	Dec '14
Pivot-Irr	127.5	127.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)				X			X					
Dry-corners	19.3	16.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)												
F-1	28.5	26.2	Decatur SICL (DdC3 5-12%)	Corn grain (Soybean)												
F-2	44.9	43.0	Decatur SICL (DcC2 5-12%)	Corn grain (Soybean)												
F-3	35.4	35.4	Dewey SIC (DwD3 12-20%)	Corn grain (Soybean)												
F-4	31.9	31.9	Dewey SIL (FsD 12-20%)	Corn grain (Soybean)												
F-5	14.6	14.6	Decatur SICL (DdC3 5-12%)	Corn grain (Soybean)												
F-7	10.5	10.5	Dewey SICL (DeC2 5-12%)	Corn grain (Soybean)												
Total	*312.6*	*305.6*						*X*			*X*					

Manure Application Planning Calendar – January 2015 through December 2015

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2015 Crop (Prev. Primary Crop)	Jan '15	Feb '15	Mar '15	Apr '15	May '15	Jun '15	Jul '15	Aug '15	Sep '15	Oct '15	Nov '15	Dec '15
Pivot-Irr	127.5	127.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)				X			X					
Dry-corners	19.3	16.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)												
F-1	28.5	26.2	Decatur SICL (DdC3 5-12%)	Soybean (Corn grain)												
F-2	44.9	43.0	Decatur SICL (DcC2 5-12%)	Soybean (Corn grain)												
F-3	35.4	35.4	Dewey SIC (DwD3 12-20%)	Soybean (Corn grain)												
F-4	31.9	31.9	Dewey SIL (FsD 12-20%)	Soybean (Corn grain)												
F-5	14.6	14.6	Decatur SICL (DdC3 5-12%)	Soybean (Corn grain)												
F-7	10.5	10.5	Dewey SICL (DeC2 5-12%)	Soybean (Corn grain)												
Total	*312.6*	*305.6*						*X*			*X*					

Crop in field	No. indicates total loads "X" indicates other manure apps

Manure Application Planning Calendar – January 2016 through December 2016

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2016 Crop (Prev. Primary Crop)	Jan '16	Feb '16	Mar '16	Apr '16	May '16	Jun '16	Jul '16	Aug '16	Sep '16	Oct '16	Nov '16	Dec '16
Pivot-Irr	127.5	127.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)				X			X					
Dry-corners	19.3	16.5	Decatur SICL (DcC2 5-12%)	Corn silage (Corn silage)												
F-1	28.5	26.2	Decatur SICL (DdC3 5-12%)	Corn grain (Soybean)												
F-2	44.9	43.0	Decatur SICL (DcC2 5-12%)	Corn grain (Soybean)												
F-3	35.4	35.4	Dewey SIC (DwD3 12-20%)	Corn grain (Soybean)												
F-4	31.9	31.9	Dewey SIL (FsD 12-20%)	Corn grain (Soybean)												
F-5	14.6	14.6	Decatur SICL (DdC3 5-12%)	Corn grain (Soybean)												
F-7	10.5	10.5	Dewey SICL (DeC2 5-12%)	Corn grain (Soybean)												
Total	*312.6*	*305.6*						*X*			*X*					

Crop in field

No. indicates total loads
"X" indicates other manure apps

6.7. Planned Nutrient Applications (Manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
Pivot-Irr	Mar 2012	Other	46-0-0	Surface broadcast	Custom	180 Lbs		22,950 Lbs	127.5	83	0	0
Pivot-Irr	Mar 2012	Other	0-0-60	Surface broadcast	Custom	200 Lbs		25,500 Lbs	127.5	0	0	120
Pivot-Irr	Apr 2012	Other	34-0-0	Surface broadcast	Custom	300 Lbs		38,250 Lbs	127.5	102	0	0
Pivot-Irr	Apr 2012	Other	Holding Pond 1	Pivot	Custom	12,000 Gal	1700 Min	1,530,000 Gal	127.5	22	22	54
Pivot-Irr	May 2012	Other	28-0-0	Surface broadcast	Custom	40 Gal		5,100 Gal	127.5	119	0	0
Pivot-Irr	Jul 2012	Corn silage	Holding Pond 1	Pivot	Custom	10,000 Gal	1417 Min	1,275,000 Gal	127.5	18	18	45
Pivot-Irr	Oct 2012	Other	0-0-60	Surface broadcast	Custom	250 Lbs		31,875 Lbs	127.5	0	0	150
Pivot-Irr	Mar 2013	Other	46-0-0	Surface broadcast	Custom	180 Lbs		22,950 Lbs	127.5	83	0	0
Pivot-Irr	Mar 2013	Other	0-0-60	Surface broadcast	Custom	200 Lbs		25,500 Lbs	127.5	0	0	120
Pivot-Irr	Apr 2013	Other	Holding Pond 1	Pivot	Custom	12,000 Gal	1700 Min	1,530,000 Gal	127.5	22	22	54
Pivot-Irr	Apr 2013	Other	34-0-0	Surface broadcast	Custom	300 Lbs		38,250 Lbs	127.5	102	0	0
Pivot-Irr	May 2013	Other	28-0-0	Surface broadcast	Custom	40 Gal		5,100 Gal	127.5	119	0	0
Pivot-Irr	Jul 2013	Corn silage	Holding Pond 1	Pivot	Custom	10,000 Gal	1417 Min	1,275,000 Gal	127.5	18	18	45
Pivot-Irr	Oct 2013	Other	0-0-60	Surface broadcast	Custom	250 Lbs		31,875 Lbs	127.5	0	0	150
Pivot-Irr	Mar 2014	Other	46-0-0	Surface broadcast	Custom	180 Lbs		22,950 Lbs	127.5	83	0	0
Pivot-Irr	Mar 2014	Other	0-0-60	Surface broadcast	Custom	200 Lbs		25,500 Lbs	127.5	0	0	120
Pivot-Irr	Apr 2014	Other	Holding Pond 1	Pivot	Custom	10,000 Gal	1417 Min	1,275,000 Gal	127.5	18	18	45
Pivot-Irr	Apr 2014	Other	34-0-0	Surface broadcast	Custom	300 Lbs		38,250 Lbs	127.5	102	0	0
Pivot-Irr	May 2014	Other	28-0-0	Surface broadcast	Custom	40 Gal		5,100 Gal	127.5	119	0	0
Pivot-Irr	Jul 2014	Corn silage	Holding Pond 1	Pivot	Custom	11,000 Gal	1558 Min	1,402,500 Gal	127.5	20	20	50
Pivot-Irr	Oct 2014	Other	0-0-60	Surface broadcast	Custom	250 Lbs		31,875 Lbs	127.5	0	0	150
Pivot-Irr	Mar 2015	Other	0-0-60	Surface broadcast	Custom	200 Lbs		25,500 Lbs	127.5	0	0	120
Pivot-Irr	Mar 2015	Other	46-0-0	Surface broadcast	Custom	180 Lbs		22,950 Lbs	127.5	83	0	0
Pivot-Irr	Apr 2015	Other	34-0-0	Surface broadcast	Custom	300 Lbs		38,250 Lbs	127.5	102	0	0
Pivot-Irr	Apr 2015	Other	Holding Pond 1	Pivot	Custom	11,000 Gal	1558 Min	1,402,500 Gal	127.5	20	20	50
Pivot-Irr	May 2015	Other	28-0-0	Surface broadcast	Custom	40 Gal		5,100 Gal	127.5	119	0	0
Pivot-Irr	Jul 2015	Corn silage	Holding Pond 1	Pivot	Custom	10,000 Gal	1417 Min	1,275,000 Gal	127.5	18	18	45

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
Pivot-Irr	Oct 2015	Other	0-0-60	Surface broadcast	Custom	250 Lbs		31,875 Lbs	127.5	0	0	150
Pivot-Irr	Mar 2016	Other	0-0-60	Surface broadcast	Custom	200 Lbs		25,500 Lbs	127.5	0	0	120
Pivot-Irr	Mar 2016	Other	46-0-0	Surface broadcast	Custom	180 Lbs		22,950 Lbs	127.5	83	0	0
Pivot-Irr	Apr 2016	Other	Holding Pond 1	Pivot	Custom	11,000 Gal	1558 Min	1,402,500 Gal	127.5	20	20	50
Pivot-Irr	Apr 2016	Other	34-0-0	Surface broadcast	Custom	300 Lbs		38,250 Lbs	127.5	102	0	0
Pivot-Irr	May 2016	Other	28-0-0	Surface broadcast	Custom	40 Gal		5,100 Gal	127.5	119	0	0
Pivot-Irr	Jul 2016	Corn silage	Holding Pond 1	Pivot	Custom	10,000 Gal	1417 Min	1,275,000 Gal	127.5	18	18	45
Pivot-Irr	Oct 2016	Other	0-0-60	Surface broadcast	Custom	250 Lbs		31,875 Lbs	127.5	0	0	150
Dry-corners	Mar 2012	Other	46-0-0	Surface broadcast	Custom	180 Lbs		2,970 Lbs	16.5	83	0	0
Dry-corners	Mar 2012	Other	0-0-60	Surface broadcast	Custom	200 Lbs		3,300 Lbs	16.5	0	0	120
Dry-corners	Apr 2012	Other	34-0-0	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	102	0	0
Dry-corners	May 2012	Other	28-0-0	Surface broadcast	Custom	40 Gal		660 Gal	16.5	119	0	0
Dry-corners	Oct 2012	Other	0-0-60	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	0	0	180
Dry-corners	Mar 2013	Other	0-0-60	Surface broadcast	Custom	200 Lbs		3,300 Lbs	16.5	0	0	120
Dry-corners	Mar 2013	Other	46-0-0	Surface broadcast	Custom	180 Lbs		2,970 Lbs	16.5	83	0	0
Dry-corners	Apr 2013	Other	34-0-0	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	102	0	0
Dry-corners	May 2013	Other	28-0-0	Surface broadcast	Custom	40 Gal		660 Gal	16.5	119	0	0
Dry-corners	Oct 2013	Other	0-0-60	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	0	0	180
Dry-corners	Mar 2014	Other	0-0-60	Surface broadcast	Custom	200 Lbs		3,300 Lbs	16.5	0	0	120
Dry-corners	Mar 2014	Other	46-0-0	Surface broadcast	Custom	180 Lbs		2,970 Lbs	16.5	83	0	0
Dry-corners	Apr 2014	Other	34-0-0	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	102	0	0
Dry-corners	May 2014	Other	28-0-0	Surface broadcast	Custom	40 Gal		660 Gal	16.5	119	0	0
Dry-corners	Oct 2014	Other	0-0-60	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	0	0	180
Dry-corners	Mar 2015	Other	46-0-0	Surface broadcast	Custom	180 Lbs		2,970 Lbs	16.5	83	0	0
Dry-corners	Mar 2015	Other	0-0-60	Surface broadcast	Custom	200 Lbs		3,300 Lbs	16.5	0	0	120
Dry-corners	Apr 2015	Other	34-0-0	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	102	0	0
Dry-corners	May 2015	Other	28-0-0	Surface broadcast	Custom	40 Gal		660 Gal	16.5	119	0	0
Dry-corners	Oct 2015	Other	0-0-60	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	0	0	180
Dry-corners	Mar 2016	Other	0-0-60	Surface broadcast	Custom	200 Lbs		3,300 Lbs	16.5	0	0	120
Dry-corners	Mar 2016	Other	46-0-0	Surface broadcast	Custom	180 Lbs		2,970 Lbs	16.5	83	0	0
Dry-corners	Apr 2016	Other	34-0-0	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	102	0	0
Dry-corners	May 2016	Other	28-0-0	Surface broadcast	Custom	40 Gal		660 Gal	16.5	119	0	0
Dry-corners	Oct 2016	Other	0-0-60	Surface broadcast	Custom	300 Lbs		4,950 Lbs	16.5	0	0	180

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
F-1	Apr 2012	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		7,860 Lbs	26.2	138	0	0
F-1	Oct 2012	Soybean	0-0-60	Surface broadcast	Custom	300 Lbs		7,860 Lbs	26.2	0	0	180
F-1	Apr 2014	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		7,860 Lbs	26.2	138	0	0
F-1	Oct 2014	Soybean	0-0-60	Surface broadcast	Custom	300 Lbs		7,860 Lbs	26.2	0	0	180
F-1	Apr 2016	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		7,860 Lbs	26.2	138	0	0
F-1	Oct 2016	Soybean	0-0-60	Surface broadcast	Custom	300 Lbs		7,860 Lbs	26.2	0	0	180
F-2	Apr 2012	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		12,900 Lbs	43.0	138	0	0
F-2	Apr 2014	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		12,900 Lbs	43.0	138	0	0
F-2	Apr 2016	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		12,900 Lbs	43.0	138	0	0
F-3	Apr 2012	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		10,620 Lbs	35.4	138	0	0
F-3	Apr 2014	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		10,620 Lbs	35.4	138	0	0
F-3	Apr 2016	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		10,620 Lbs	35.4	138	0	0
F-4	Apr 2012	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		9,570 Lbs	31.9	138	0	0
F-4	Oct 2012	Soybean	0-0-60	Surface broadcast	Custom	200 Lbs		6,380 Lbs	31.9	0	0	120
F-4	Apr 2014	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		9,570 Lbs	31.9	138	0	0
F-4	Oct 2014	Soybean	0-0-60	Surface broadcast	Custom	200 Lbs		6,380 Lbs	31.9	0	0	120
F-4	Apr 2016	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		9,570 Lbs	31.9	138	0	0
F-4	Oct 2016	Soybean	0-0-60	Surface broadcast	Custom	200 Lbs		6,380 Lbs	31.9	0	0	120
F-5	Apr 2012	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		4,380 Lbs	14.6	138	0	0
F-5	Oct 2012	Soybean	0-0-60	Surface broadcast	Custom	200 Lbs		2,920 Lbs	14.6	0	0	120
F-5	Apr 2014	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		4,380 Lbs	14.6	138	0	0
F-5	Oct 2014	Soybean	0-0-60	Surface broadcast	Custom	200 Lbs		2,920 Lbs	14.6	0	0	120
F-5	Apr 2016	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		4,380 Lbs	14.6	138	0	0
F-5	Oct 2016	Soybean	0-0-60	Surface broadcast	Custom	200 Lbs		2,920 Lbs	14.6	0	0	120
F-7	Apr 2012	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		3,150 Lbs	10.5	138	0	0
F-7	Oct 2012	Soybean	0-0-60	Surface broadcast	Custom	150 Lbs		1,575 Lbs	10.5	0	0	90
F-7	Apr 2014	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		3,150 Lbs	10.5	138	0	0
F-7	Oct 2014	Soybean	0-0-60	Surface broadcast	Custom	150 Lbs		1,575 Lbs	10.5	0	0	90
F-7	Apr 2016	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs		3,150 Lbs	10.5	138	0	0
F-7	Oct 2016	Soybean	0-0-60	Surface broadcast	Custom	150 Lbs		1,575 Lbs	10.5	0	0	90

Planned Nutrient Applications (Non-manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
Dry-corners	Mar 2012	Other	0-0-60	Surface broadcast	Custom	200 Lbs	560 Lbs	2.8	0	0	120
Dry-corners	Mar 2012	Other	46-0-0	Surface broadcast	Custom	180 Lbs	504 Lbs	2.8	83	0	0
Dry-corners	Apr 2012	Other	34-0-0	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	102	0	0
Dry-corners	May 2012	Other	28-0-0	Surface broadcast	Custom	40 Gal	112 Gal	2.8	119	0	0
Dry-corners	Oct 2012	Other	0-0-60	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	0	0	180
Dry-corners	Mar 2013	Other	46-0-0	Surface broadcast	Custom	180 Lbs	504 Lbs	2.8	83	0	0
Dry-corners	Mar 2013	Other	0-0-60	Surface broadcast	Custom	200 Lbs	560 Lbs	2.8	0	0	120
Dry-corners	Apr 2013	Other	34-0-0	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	102	0	0
Dry-corners	May 2013	Other	28-0-0	Surface broadcast	Custom	40 Gal	112 Gal	2.8	119	0	0
Dry-corners	Oct 2013	Other	0-0-60	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	0	0	180
Dry-corners	Mar 2014	Other	46-0-0	Surface broadcast	Custom	180 Lbs	504 Lbs	2.8	83	0	0
Dry-corners	Mar 2014	Other	0-0-60	Surface broadcast	Custom	200 Lbs	560 Lbs	2.8	0	0	120
Dry-corners	Apr 2014	Other	34-0-0	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	102	0	0
Dry-corners	May 2014	Other	28-0-0	Surface broadcast	Custom	40 Gal	112 Gal	2.8	119	0	0
Dry-corners	Oct 2014	Other	0-0-60	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	0	0	180
Dry-corners	Mar 2015	Other	0-0-60	Surface broadcast	Custom	200 Lbs	560 Lbs	2.8	0	0	120
Dry-corners	Mar 2015	Other	46-0-0	Surface broadcast	Custom	180 Lbs	504 Lbs	2.8	83	0	0
Dry-corners	Apr 2015	Other	34-0-0	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	102	0	0
Dry-corners	May 2015	Other	28-0-0	Surface broadcast	Custom	40 Gal	112 Gal	2.8	119	0	0
Dry-corners	Oct 2015	Other	0-0-60	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	0	0	180
Dry-corners	Mar 2016	Other	46-0-0	Surface broadcast	Custom	180 Lbs	504 Lbs	2.8	83	0	0
Dry-corners	Mar 2016	Other	0-0-60	Surface broadcast	Custom	200 Lbs	560 Lbs	2.8	0	0	120
Dry-corners	Apr 2016	Other	34-0-0	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	102	0	0
Dry-corners	May 2016	Other	28-0-0	Surface broadcast	Custom	40 Gal	112 Gal	2.8	119	0	0
Dry-corners	Oct 2016	Other	0-0-60	Surface broadcast	Custom	300 Lbs	840 Lbs	2.8	0	0	180
F-1	Apr 2012	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs	690 Lbs	2.3	138	0	0
F-1	Oct 2012	Soybean	0-0-60	Surface broadcast	Custom	300 Lbs	690 Lbs	2.3	0	0	180
F-1	Apr 2014	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs	690 Lbs	2.3	138	0	0
F-1	Oct 2014	Soybean	0-0-60	Surface broadcast	Custom	300 Lbs	690 Lbs	2.3	0	0	180
F-1	Apr 2016	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs	690 Lbs	2.3	138	0	0
F-1	Oct 2016	Soybean	0-0-60	Surface broadcast	Custom	300 Lbs	690 Lbs	2.3	0	0	180
F-2	Apr 2012	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs	570 Lbs	1.9	138	0	0
F-2	Apr 2014	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs	570 Lbs	1.9	138	0	0
F-2	Apr 2016	Corn grain	46-0-0	Surface broadcast	Custom	300 Lbs	570 Lbs	1.9	138	0	0

6.8. Field Nutrient Balance (Manure-spreadable Area)

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
2012	Pivot-Irr	127.5	Other	7											
2012	Pivot-Irr	127.5	Corn silage	22	250¤	0¤	320¤	344	40	219					
2013	Pivot-Irr	127.5	Other	7											
2013	Pivot-Irr	127.5	Corn silage	22	250¤	0¤	320¤	344	40	369					
2014	Pivot-Irr	127.5	Other	7											
2014	Pivot-Irr	127.5	Corn silage	22	250¤	0¤	320¤	342	38	365					
2015	Pivot-Irr	127.5	Other	7											
2015	Pivot-Irr	127.5	Corn silage	22	250¤	0¤	320¤	342	38	365					
2016	Pivot-Irr	127.5	Other	7											
2016	Pivot-Irr	127.5	Corn silage	22	250¤	0¤	320¤	342	38	365					
Total	**Pivot-Irr**				**0**	**0**	**0**	**1714**	**194**	**1683**					
2012	Dry-corners	16.5	Other	4											
2012	Dry-corners	16.5	Corn silage	20	150	0	0	304	0	120					
2013	Dry-corners	16.5	Other	4											
2013	Dry-corners	16.5	Corn silage	20	150	0	0	304	0	300					
2014	Dry-corners	16.5	Other	4											
2014	Dry-corners	16.5	Corn silage	20	150	0	0	304	0	300					
2015	Dry-corners	16.5	Other	4											
2015	Dry-corners	16.5	Corn silage	20	150	0	0	304	0	300					
2016	Dry-corners	16.5	Other	4											
2016	Dry-corners	16.5	Corn silage	20	150	0	0	304	0	300					
Total	**Dry-corners**				**0**	**0**	**0**	**1520**	**0**	**1320**					
2012	F-1	26.2	Corn grain	160	160	0	140	138	0	0	-22	0	-140	-70	-46
2013	F-1	26.2	Soybean	50	0	0	80	0	0	180	0	0	100	-40	110
2014	F-1	26.2	Corn grain	160	160	0	140	138	0	0	-22	0	-40	-70	64
2015	F-1	26.2	Soybean	50	0	0	80	0	0	180	0	0	100	-40	174
2016	F-1	26.2	Corn grain	160	160	0	140	138	0	0	-22	0	-40	-70	128
Total	**F-1**				**480**	**0**	**580**	**414**	**0**	**360**					
2012	F-2	43.0	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
2013	F-2	43.0	Soybean	50	0	0	0	0	0	0	0	0	0	-40	-70
2014	F-2	43.0	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
2015	F-2	43.0	Soybean	50	0	0	0	0	0	0	0	0	0	-40	-70
2016	F-2	43.0	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
Total	**F-2**				**480**	**0**	**0**	**414**	**0**	**0**					
2012	F-3	35.4	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
2013	F-3	35.4	Soybean	50	0	0	0	0	0	0	0	0	0	-40	-70
2014	F-3	35.4	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
2015	F-3	35.4	Soybean	50	0	0	0	0	0	0	0	0	0	-40	-70
2016	F-3	35.4	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
Total	**F-3**				**480**	**0**	**0**	**414**	**0**	**0**					
2012	F-4	31.9	Corn grain	160	160	0	70	138	0	0	-22	0	-70	-70	-46
2013	F-4	31.9	Soybean	50	0	0	40	0	0	120	0	0	80	-40	50
2014	F-4	31.9	Corn grain	160	160	0	70	138	0	0	-22	0	10	-70	4
2015	F-4	31.9	Soybean	50	0	0	40	0	0	120	0	0	90	-40	54
2016	F-4	31.9	Corn grain	160	160	0	70	138	0	0	-22	0	20	-70	8
Total	**F-4**				**480**	**0**	**290**	**414**	**0**	**240**					
2012	F-5	14.6	Corn grain	160	160	0	70	138	0	0	-22	0	-70	-70	-46
2013	F-5	14.6	Soybean	50	0	0	40	0	0	120	0	0	80	-40	50
2014	F-5	14.6	Corn grain	160	160	0	70	138	0	0	-22	0	10	-70	4
2015	F-5	14.6	Soybean	50	0	0	40	0	0	120	0	0	90	-40	54
2016	F-5	14.6	Corn grain	160	160	0	70	138	0	0	-22	0	20	-70	8
Total	**F-5**				**480**	**0**	**290**	**414**	**0**	**240**					
2012	F-7	10.5	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
2013	F-7	10.5	Soybean	50	0	0	0	0	0	90	0	0	90	-40	20
2014	F-7	10.5	Corn grain	160	160	0	0	138	0	0	-22	0	90	-70	-26
2015	F-7	10.5	Soybean	50	0	0	0	0	0	90	0	0	180	-40	20
2016	F-7	10.5	Corn grain	160	160	0	0	138	0	0	-22	0	180	-70	-26
Total	**F-7**				**480**	**0**	**0**	**414**	**0**	**180**					

Field Nutrient Balance (Non-manure-spreadable Area)

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
2012	Dry-corners	2.8	Other	4											
2012	Dry-corners	2.8	Corn silage	20	150	0	0	304	0	120					
2013	Dry-corners	2.8	Other	4											
2013	Dry-corners	2.8	Corn silage	20	150	0	0	304	0	300					
2014	Dry-corners	2.8	Other	4											
2014	Dry-corners	2.8	Corn silage	20	150	0	0	304	0	300					
2015	Dry-corners	2.8	Other	4											
2015	Dry-corners	2.8	Corn silage	20	150	0	0	304	0	300					
2016	Dry-corners	2.8	Other	4											
2016	Dry-corners	2.8	Corn silage	20	150	0	0	304	0	300					
Total	**Dry-corners**				**0**	**0**	**0**	**1520**	**0**	**1320**					
2012	F-1	2.3	Corn grain	160	160	0	140	138	0	0	-22	0	-140	-70	-46
2013	F-1	2.3	Soybean	50	0	0	80	0	0	180	0	0	100	-40	110
2014	F-1	2.3	Corn grain	160	160	0	140	138	0	0	-22	0	-40	-70	64
2015	F-1	2.3	Soybean	50	0	0	80	0	0	180	0	0	100	-40	174
2016	F-1	2.3	Corn grain	160	160	0	140	138	0	0	-22	0	-40	-70	128
Total	**F-1**				**480**	**0**	**580**	**414**	**0**	**360**					
2012	F-2	1.9	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
2013	F-2	1.9	Soybean	50	0	0	0	0	0	0	0	0	0	-40	-70
2014	F-2	1.9	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
2015	F-2	1.9	Soybean	50	0	0	0	0	0	0	0	0	0	-40	-70
2016	F-2	1.9	Corn grain	160	160	0	0	138	0	0	-22	0	0	-70	-46
Total	**F-2**				**480**	**0**	**0**	**414**	**0**	**0**					

[1] Fertilizer Recs are the crop fertilizer recommendations. The N rec accounts for any N credit from previous legume crop.

[2] Nutrients Applied are the nutrients expected to be available to the crop from that year's manure applications plus nutrients from that year's commercial fertilizer applications and nitrates from irrigation water. With a double-crop year, the total nutrients applied for both crops and the year's balances are listed on the second crop's line.

[3] For N, Nutrients Applied minus Fertilizer Recs for indicated crop year. Also includes amount of residual N expected to become available that year from prior years' manure applications. For P_2O_5 and K_2O, Nutrients Applied minus Fertilizer Recs *through* the indicated crop year, with positive balances carried forward to subsequent years. Negative values indicate a potential need to apply additional nutrients.

[4] Nutrients Applied minus amount removed by harvested portion of crop through the indicated year. Positive balances are carried forward to subsequent years.

[¤] Indicates a custom fertilizer recommendation in the Fertilizer Recs column.

[a] Indicates in the Balance After Recs N column that the legume crop is assumed to utilize some or all of the supplied N.

[†] Indicates in the Balance After Recs N column that the value includes residual N expected to become available that year from prior years' manure applications.

6.9. Manure Inventory Annual Summary

Manure Source	Plan Period	On Hand at Start of Period	Total Generated	Total Imported	Total Trans-ferred In	Total Applied	Total Exported	Total Trans-ferred Out	On Hand at End of Period	Units
Holding Pond 1	Jan '12 - Dec '12	1,300,000	2,500,000	0	200,000	2,805,000	0	0	1,195,000	Gal
Parlor Pond	Jan '12 - Dec '12	125,000	200,000	0	0	0	0	200,000	125,000	Gal
All Sources	**Jan '12 - Dec '12**	**1,425,000**	**2,700,000**	**0**	**200,000**	**2,805,000**	**0**	**200,000**	**1,320,000**	**Gal**
Holding Pond 1	Jan '13 - Dec '13	1,195,000	2,500,000	0	200,000	2,805,000	0	0	1,090,000	Gal
Parlor Pond	Jan '13 - Dec '13	125,000	200,000	0	0	0	0	200,000	125,000	Gal
All Sources	**Jan '13 - Dec '13**	**1,320,000**	**2,700,000**	**0**	**200,000**	**2,805,000**	**0**	**200,000**	**1,215,000**	**Gal**
Holding Pond 1	Jan '14 - Dec '14	1,090,000	2,500,000	0	200,000	2,677,500	0	0	1,112,500	Gal
Parlor Pond	Jan '14 - Dec '14	125,000	200,000	0	0	0	0	200,000	125,000	Gal
All Sources	**Jan '14 - Dec '14**	**1,215,000**	**2,700,000**	**0**	**200,000**	**2,677,500**	**0**	**200,000**	**1,237,500**	**Gal**
Holding Pond 1	Jan '15 - Dec '15	1,112,500	2,500,000	0	200,000	2,677,500	0	0	1,135,000	Gal
Parlor Pond	Jan '15 - Dec '15	125,000	200,000	0	0	0	0	200,000	125,000	Gal
All Sources	**Jan '15 - Dec '15**	**1,237,500**	**2,700,000**	**0**	**200,000**	**2,677,500**	**0**	**200,000**	**1,260,000**	**Gal**
Holding Pond 1	Jan '16 - Dec '16	1,135,000	2,500,000	0	200,000	2,677,500	0	0	1,157,500	Gal
Parlor Pond	Jan '16 - Dec '16	125,000	200,000	0	0	0	0	200,000	125,000	Gal
All Sources	**Jan '16 - Dec '16**	**1,260,000**	**2,700,000**	**0**	**200,000**	**2,677,500**	**0**	**200,000**	**1,282,500**	**Gal**

6.10. Fertilizer Material Annual Summary

Product Analysis	Plan Period	Product Needed Jan - Aug	Product Needed Sep - Dec	Total Product Needed	Units
46-0-0	Jan '12 - Dec '12	76,164	0	76,164	Lbs
34-0-0	Jan '12 - Dec '12	44,040	0	44,040	Lbs
28-0-0	Jan '12 - Dec '12	5,872	0	5,872	Gal
0-0-60	Jan '12 - Dec '12	29,360	57,090	86,450	Lbs
46-0-0	Jan '13 - Dec '13	26,424	0	26,424	Lbs
34-0-0	Jan '13 - Dec '13	44,040	0	44,040	Lbs
28-0-0	Jan '13 - Dec '13	5,872	0	5,872	Gal
0-0-60	Jan '13 - Dec '13	29,360	37,665	67,025	Lbs
46-0-0	Jan '14 - Dec '14	76,164	0	76,164	Lbs
34-0-0	Jan '14 - Dec '14	44,040	0	44,040	Lbs
28-0-0	Jan '14 - Dec '14	5,872	0	5,872	Gal
0-0-60	Jan '14 - Dec '14	29,360	57,090	86,450	Lbs
46-0-0	Jan '15 - Dec '15	26,424	0	26,424	Lbs
34-0-0	Jan '15 - Dec '15	44,040	0	44,040	Lbs
28-0-0	Jan '15 - Dec '15	5,872	0	5,872	Gal
0-0-60	Jan '15 - Dec '15	29,360	37,665	67,025	Lbs
46-0-0	Jan '16 - Dec '16	76,164	0	76,164	Lbs
34-0-0	Jan '16 - Dec '16	44,040	0	44,040	Lbs
28-0-0	Jan '16 - Dec '16	5,872	0	5,872	Gal
0-0-60	Jan '16 - Dec '16	29,360	57,090	86,450	Lbs

6.11. Whole-farm Nutrient Balance (Manure-spreadable Area)

	N (Lbs)	P_2O_5 (Lbs)	K_2O (Lbs)
Total Manure Nutrients on Hand at Start of Plan[1]	5,842	2,565	6,412
Total Manure Nutrients Collected[2]	55,350	24,300	60,750
Total Manure Nutrients Imported[3]	0	0	0
Total Manure Nutrients Exported[4]	0	0	0
Total Manure Nutrients on Hand at End of Plan[5]	5,258	2,308	5,771
Total Manure Nutrients Applied[6]	55,845	24,735	61,582
Available Manure Nutrients Applied[7]	26,520	24,735	61,582
Commercial Fertilizer Nutrients Applied[8]	285,782	0	230,598
Available Nutrients Applied[9]	312,302	24,735	292,180
Nutrient Utilization Potential[10]	313,958	103,166	273,880
Nutrient Balance of Spreadable Acres[11*]	-1,656	-78,431	18,300
Average Nutrient Balance per Spreadable Acre per Year[12*]	-1	-51	12

1. Values indicate total manure nutrients present in storage(s) at the beginning of the plan.
2. Values indicate total manure nutrients collected on the farm.
3. Values indicate total manure nutrients imported onto the farm.
4. Values indicate total manure nutrients exported from the farm to an external operation.
5. Values indicate total manure nutrients present in storage(s) at the end of plan.
6. Values indicate total nutrients present in land-applied manure. Losses due to rate, timing and method of application are not included in these values.
7. Values indicate available manure nutrients applied on the farm based on rate, time and method of application. These values are based on the total manure nutrients applied (row 6) after accounting for state-specific nutrient losses due to rate, time and method of application.
8. Values indicate nutrients applied as commercial fertilizers and nitrates contained in irrigation water.
9. Values are the sum of available manure nutrients applied (row 7) and commercial fertilizer nutrients applied (row 8).
10. Values indicate nutrient utilization potential of crops grown. For N the value generally is based on crop N recommendation for non-legume crops and crop N uptake or other state-imposed limit for N application rates for legumes. P_2O_5 and K_2O values generally are based on fertilizer recommendations or crop removal (whichever is greatest).
11. Values indicate available nutrients applied (row 9) minus crop nutrient utilization potential (row 10). Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
12. Values indicate average per acre nutrient balance. Values are calculated by dividing nutrient balance of spreadable acres (row 11) by the number of spreadable acres in plan and by the length of the plan in years. Negative values indicate additional average per acre nutrient utilization potential and positive values indicate average per acre over-application.

Whole-farm Nutrient Balance (Non-manure-spreadable Area)

	N (Lbs)	P_2O_5 (Lbs)	K_2O (Lbs)
Commercial Fertilizer Nutrients Applied[1]	5,995	0	5,442
Nutrient Utilization Potential[2]	4,116	0	1,334
Nutrient Balance of Non-spreadable Acres[3*]	1,879	0	4,108
Average Nutrient Balance per Non-spreadable Acre per Year[4*]	54	0	117

1. Values indicate nutrients applied as commercial fertilizers and nitrates contained in irrigation water.
2. Values indicate nutrient utilization potential of crops grown based on crop fertilizer recommendations.
3. Values indicate commercial fertilizer nutrients applied (row 1) minus crop nutrient utilization potential (row 2). Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
4. Values indicate average per acre nutrient balance. Values are calculated by dividing nutrient balance of non-spreadable acres (row 3) by number of non-spreadable acres in plan. Negative values indicate additional average per acre nutrient utilization potential and positive values indicate average per acre over-application.

6-12. Projected Soil P & K levels.

Projected Soil P And K Levels

Plan File: S:\TENNESSEE-projects\Jason Smith\Springbrook Dairy-CNMP, 2012-2016\Springbrook Dairy-.mmp
Last Saved: 6/14/2012
Operation: Springbrook Dairy Farm ***State:*** Tennessee ***Init. File Rev:*** 11/8/2011

Field ID	Sub ID	P Level At Start Of Plan	P Level At End Of Plan	K Level At Start Of Plan	K Level At End Of Plan	Units
Pivot-Irr		89	77	241	261	Lb/A
Dry-corners		89	80	241	255	ppm
F-1		100	93	92	124	Lb/A
F-2		93	86	312	301	Lb/A
F-3		334	327	347	346	Lb/A
F-4		236	229	179	181	Lb/A
F-5		190	183	146	148	Lb/A
F-7		187	180	207	201	Lb/A

Notes
Equations used to determine change in soil test P and K:
Change in P (Lb/A) = Null
Change in K (Lb/A) = Null

Section 7. Feed Management

Optional, not implemented at this time.

Section 8. Other Utilization Options

No alternative utilization options are implemented at this time.

Section 9. Record Keeping Forms
Annual Reports 2011-2015

Section 10. References

10.1. Publications

Crop Fertilizer Recommendations

"Lime and Fertilizer Recommendations for the Various Crops of Tennessee," BEES Info #100, Aug 2008
http://soilplantandpest.utk.edu/publications/soilfertilizerpubs.htm

Manure Application Setback Features/Distances

Nutrient Management Standard 590
http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc

TN DEQ Rule 1200-4-5-.14(17)(d)
http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-05.pdf

TN DEQ Rule 1200-4-5-.14(17)(d)
http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-05.pdf

Manure Nutrient Availability

"Manure Application Management," Tables 3 and 4, Tennessee Extension, PB1510, 2/94
http://wastemgmt.ag.utk.edu/ExtensionProjects/extension_publications.htm

Phosphorus Assessment

"Tennessee Phosphorus Index," Tennessee NRCS, Nov. 2001

Practice Standards

Tennessee NRCS Nutrient Management Standard (590), Jan. 2003
http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc

10.2. Software and Data Sources

MMP Version	MMP 0.3.1.0
MMP Plan File	Springbrook Dairy-.mmp 6/14/2012 8:49:43 PM
MMP Initialization File for Tennessee	11/8/2011
MMP Soils File for Tennessee	8/29/2011
Phosphorus Assessment Tool	2009.02.20
NRCS Conservation Plan(s)	n/a
RUSLE2 Library	Version: 1.32.3.0 Build: Dec 17 2007 Science: 20061020
RUSLE2 Database	Moses-TN.gdb